RAILROAD GAZETTE

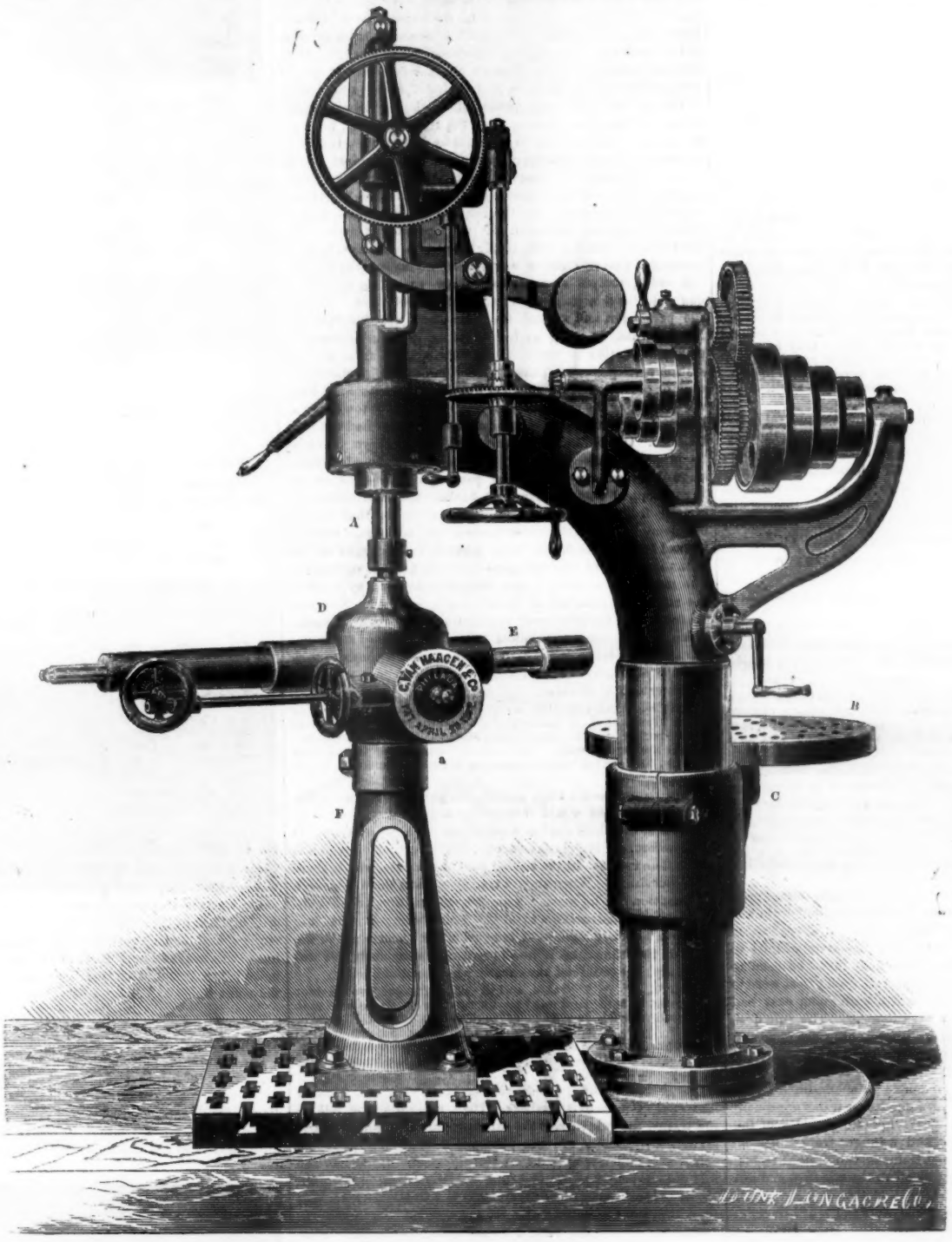
SATURDAY, DECEMBER 28, 1872.

Improvement in Drilling Machines.

This invention consists of an attachment for an ordinary vertical drill press whereby it may be converted into a horizontal drill, thus dispensing with the necessity for other and expensive machines. Our engraving represents Messrs. Wm. B. Bement & Sons' improved drill press with the arrangement for horizontal drilling.

A is the vertical spindle of the drill press, having at its lower end the usual enlargement and orifice for receiving the drill. *B* is the vertically adjustable table for receiving the object to be drilled. *E* is the horizontal drill spindle, which is driven by a pair of bevel wheels inside the casing, *D*. These receive their motion from a vertical shaft inserted in the drill socket of the spindle of the drill press. The spindle, *E*, can be adjusted to any angle required for drilling. The object to be drilled may be attached to the table, *B*, or, if it is required to raise or lower the drill vertically, it may be attached to the bracket, *C*, by removing the table, *B*, and turning the bracket around so that the center hole, which receives a projection on the table, may be directly under the vertical spindle. The horizontal drilling arrangement can then be detached from the stand, *F*, and the cylindrical projection, *a*, be introduced into the hole in the bracket. As the latter is adjustable vertically, the drill can thus be raised or lowered at pleasure. The horizontal drill has both hand and self-feed, and has twelve inches traverse, with three changes of speed.

This attachment can be used with any drill press, and is not intended exclusively for the one illustrated in the engraving. The horizontal drill is patented and manufactured by Messrs. C. Van Haagen & Co., of No. 2,341 Callowhill street, Philadelphia.



C. VAN HAAGEN & CO.'S IMPROVEMENT IN DRILLING MACHINES.

Holding a Check.

The Bridgeport (Conn.) *Standard* says:

"Fourteen years ago, a regularly checked trunk arrived by one of the trains at the Bridgeport depot, and, no one calling for it, it was placed in the baggage-room. No person called to claim the trunk for eleven years. At the expiration of that time, a gentleman appeared at the baggage-room and inquired of the baggage-master if he had in his possession a trunk that came to Bridgeport by rail, some eleven years ago. Upon being answered in the affirmative, he presented a duplicate check, and inquired how much he had to pay for the storage. The baggage-master examined the check, and found it would be about $2 for the eleven years. The gentleman said the price was satisfactory, and he would call the next day, pay up the cost of the storage, and take the trunk away. He then left. Three more years have now passed, but the gentleman has not returned for the trunk, and it still awaits an owner at the baggage storerooms of the New York, New Haven & Hartford Railroad, in this city."

Buffalo Car Works.

The works of this company are now in full operation. The buildings comprise a wood machine shop 160 by 73 feet, an erecting shop 180 by 73, a blacksmith shop 139 by 60, with 20 fires; a machine shop 80 by 60, a pattern shop 70 by 60, and a store room 35 by 60 feet. There is also a fire-proof paint house 24 by 16, and an engine house 45 by 45 feet. The capacity of the works is from six to eight freight cars per day. The shops are situated between the Erie and the Buffalo, New York & Philadelphia roads, and side tracks from both roads are laid into the yard of the car works.

Contributions.

Rules and Regulations of Massachusetts Railroads.

CONTINUED FROM PAGE 541.

(*b*) 15. "All orders and messages relative to the movement of trains must be written in full (except the telegraphic abbreviations of certain prescribed questions and answers, which are perfectly understood by operators, conductors and enginemen). No such dispatch must be delivered until confirmed by repeating and answer."

What are the prescribed abbreviations? In a code intended to be complete, the list of authorized abbreviations should be given. By what authority does the committee assume that the abbreviations are perfectly understood by operators, conductors and enginemen? Here was an opportunity to establish a standard of abbreviations, uniformity in which is a *sine qua non* to the maximum attainable safety.

(*b*) 17. "Conductors must in no case leave a station, when directed by special order, without having the same in writing, with the assurance of the person sending it that the conductor's understanding is correct."

What is a special order? No definition is given. In the whole code there are no instructions to conductors and enginemen as to when they should have special orders, and when such are not required. One most important rule regarding special orders the committee make no mention of: When a train, noticing an order signal, stops, it should not move on again without an order in writing from the operator, even though the signal be for another train. This regulation has been long in operation on the Grand Trunk Railway of Canada, and I was much astonished to find that some of the crack Western roads had not adopted it, but I am still more astonished to find that it has been omitted from a code gotten up "with the faithful and laborious co-operation" of men claiming to have accomplished "all that human foresight can suggest." I need

hardly point out the necessity for this rule; how the operator might carelessly answer the conductor's inquiry; how the operator might mistake the number of the train; how the conductor might mistake the answer of the operator; how the conductor might take the careless answer of some one not authorized: in short, what an opening there is for mistake and *post facto* disputes, in verbal instructions in matters of such importance. I know of more than one instance where a train for which there was an order left the station without getting it, owing to verbal mistakes.

(*b*) 18. "In case of accident or detention of a train beyond the card time of such train, notice must be at once given at the nearest station, and the information telegraphed to the central or terminal station, and to those points where approaching trains may be signalled."

Could anything be more delightfully non-committal than this? What is meant by "notice must be *at once given* at the nearest station?" If a train is detained beyond its card time, does it merely give notice at the nearest station and pass on as usual? To whom is the notice to be given? By whom is the notice to be given? Is it immaterial whether the information be telegraphed to the terminal or to the central station? What is meant by "the information must be telegraphed to those points where approaching trains may be signalled? Is information to be telegraphed to those points when the train is detained beyond card time?

TRAIN SERVICE.

(*a*) 19. "When a passenger and a freight train have the same time of departure on table, the passenger train will go first."

As the authors of this code do not appear to have racked their brains to discover possible derangements or difficulties, we must conclude that the tables do now and then show two trains as due to leave at the same moment in the same direction, which does not say much for the table-framers.

(*a*) 20. "A regular passenger train following another passenger train of the same class, or a regular freight train following a freight train must be kept not less than 10 minutes behind that which preceeded it. An accommodation may follow an express passenger train in five minutes; but if running ahead of an express train, the accommodation must keep 15 minutes off the time of the express, unless special orders shall otherwise direct."

Who is responsible for keeping the 10 minutes interval? Not the conductor, because he cannot know at what time the preceding train left the station. In case of accident, owing to intervals not being observed, it would be impossible under this code to fix the blame on any one. Who is responsible for keeping the accommodation train 15 minutes off the time of the express train. In this case the conductor should. Why should the accommodation train be kept fifteen minutes off time of following train and a freight only ten minutes, as provided in the next rule. (*a* 21.)

(*a*) 22. "Extra passenger trains must keep 10 minutes out of the way of regular trains."

Are they to be kept out of the way of regular freight trains? According to this rule they should be, but if so what is meant by (*a*) 19: "Passenger trains shall take precedence of freight trains, etc.?"

(*a*) 23. "No train other than an express train will pass a station where there is no bridge for crossing the track while a passenger train is discharging or receiving passengers, and no express train shall pass such station without due warning and at a speed exceeding ten miles per hour."

Without due warning. What is considered due warning and who is to give it? Is the engine to whistle or is the station agent to warn the passengers? The rule as it is gives no clue.

(*a*) 24. "When two accommodation passenger trains approach a station at the same time the train running in a particular direction (as the superintendent may designate) must stop before reaching the station and wait until the other train has passed the station."

Apparently we have here another class of train mentioned. Is there any difference between an "accommodation" train and an "accommodation passenger' train? What is the definition of "station?" I have always understood the station limits to be the "distant signals." The word here must be used to designate the station platform, for if a train going west were to to stop outside the station limits until a train going east had passed them a collision would be imminent. The rule does not, it is true, say that the trains approaching are opposing ones, but leaves that to be inferred from the remark about the train in "a particular direction." Neither is there anything to show whether the rule applies to double or single-track roads. This rule (24) provides for two accommodation trains approaching a station together, and the next rule (25) provides in the same way for "a passenger train and a freight train;" but no regulation is made for two express trains or two freight trains, although I see no reason for provision in the one case and not in the other.

(*b*) 27. "The speed of the several classes of trains will be regulated by distinct and fixed orders from the Superintendent, and such orders must be strictly observed by conductors and enginemen, unless by special orders they are authorized to run at a different rate."

Who is authorized to give such special orders? May the train dispatcher? If so, here is a fruitful source of damage and of accident.

(*b*) 28. "No train will leave a station earlier than the time named in the time-table; provided that when several freight trains are running upon the same schedule the intervals of time between the several trains may be such as each road shall prescribe."

It is difficult to understand what is meant by the proviso; tacked on as it is to the rule, it must have some reference thereto, but can have none unless it be to authorize the dispatch of one or more of the several freight trains in advance of schedule time. If this be the meaning of the proviso, we have here another fruitful source of accidents.

(*b*) 29. "All drawbridges, &c., * * * should be run over at a moderate and uniform speed.

What is a moderate speed? Is that left to the discretion of the engineman?

(*c*) 31. "Where there is a double track, &c., * * * a red flag by day, or a red light by night, must be sent in the direction in which the train is moving, a sufficient distance in advance to secure the safety of any approaching train," &c,

What is a sufficient distance? Is it left to the discretion of the signalman? A minimum distance should be fixed.

(*d*) 32. "A train must not leave a station expecting to meet at the next station a train having the preference of road, unless it has its full schedule time to reach the meeting point."

This rule, if acted up to, would justify a conductor in refusing a "special order," as it is not qualified in any way. It may be argued that a special order transfers the preference of road; but the distinction is too fine.

(*d*) 33. "At meeting points between two trains of same class, the train not having preference of road must take the siding and be clear of main track before the leaving time of the opposite train."

(*d*) 34. "In cases where a freight train meets a passenger train, the freight train must clear the passenger train ten minutes."

I should like to know why this difference is made; in the one case the train must be clear of the main track before leaving-time of the opposing train, and in the other case 10 minutes before the leaving-time. Provided the incoming train be clear of the track and the outgoing one do not start until the track is clear, there can be no danger whether the track is cleared one minute or half an hour previously. Possibly the framers of the code intended to provide against delay of the passenger, owing to the slow movement of the freight. If so, the rule should have directed the freight not to start from any station expecting to meet a passenger at the next one, unless it has full ten minutes over its card running time from time of starting until the passenger's starting time. Such a rule would prohibit reckless hurrying over the road, at the same time that it provided against detention of the passenger train. As the rule stands in the code, it might lead to accident, thus: a passenger having right of way, therefore not looking for special order, arrives at a station where, according to card, it ought to meet a freight. The freight is not there. On goes the passenger, and around the next curve collides with the freight, which is going at full speed in the vain endeavor to make the station in time. The freight started from the last station perhaps too late, the engineer having made miscalculation, or perhaps started in good time and met with some little misfortune, or the rails were slippery, or his train too heavy at the grade, or some other slight derangement that had not been foreseen. Of course if the train had broken down, it should be properly protected, or if the engineman found himself when between stations on the passenger's time, he should have dropped a signalman and backed into the station he started from; but if everything were done that should be done, we would never have a collision, whereas the sad fact is announced to us monthly in the pages of the RAILROAD GAZETTE that collisions do occur, and not very rarely. The liability to accident is not altogether averted by wording the rules I suggest, but it is very much lessened. No doubt the framers of the code mean exactly what they ought to mean, which is that the ten minutes must be calculated for at the start, and not taken out of card running time; if they do, their mode of expression is an unhappy one, as it does not make their meaning at all clear.

"(*d*) 35. When expected trains are not found at the passing places designated on the schedule, trains must be run with great caution to the succeeding station, until the expected train is met and passed. Trains should stop, or approach with caution, the switch used by passing trains to come on to the siding."

Until the expected train is met and passed! The carrying out of this order would necessitate a general "slowing" of trains over the whole road as soon as one train got off time. It is, therefore, an impracticable one, the insertion of which is worse than useless. In the second part of the rule, why is there such indecision? When should trains stop and when approach with caution? The words "approach with caution" render unnecessary the instructions to stop. The wording of this rule indicates a certain amount of indecision and uncertainty in the mind of the framer, as if he thought that some such rule was necessary, but could not say exactly what it should be.

"(*d*) 36. * * * "One, and in case of danger, two efficient men must be sent backward or forward, or both, as the case may require, with red flags or lanterns at least half a mile, * * * * * * and staying there till the approaching train is stopped; and if a second, third or fourth train is to follow, the same precautions must be observed until the track is clear for any following train."

One or two, backward or forward or both, with red flags or lanterns! Comment is needless. Then, regarding the following trains, the rule says, "the same precautions must be observed." By whom are the precautions to be observed? Of course it is understood that each train protects itself, but the rule does not say so. A good rule, and the safest, in my opinion, is to make every train that comes to a stand between stations throw out signalmen at once, and that the rear signalman should on no account return to his train, but remain to be picked up by the succeeding one.

(*a*) 41. "When on duty, all employees whose duties bring them in contact with passengers will wear a cap or uniform prescribed for their respective positions."

This is very vague. Why are not the classes of employees who are to wear uniform specified? Why not say, "All employees who have been furnished with uniforms must wear such whenever on duty"?

(*a*) 46. "He must see that his train is provided with everything required by the regulations of the road, including the tools and implements required by law, etc."

What are these tools and implements, etc.? The information is not to be gleaned from the code. HINDOO.

[TO BE CONTINUED.]

Changing a Curve for Different Tangents.

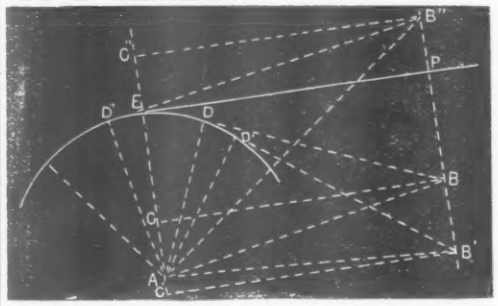
ANN ARBOR, Mich., December 11, 1872.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Below is a solution of the problem given by "R. O. B," on page 521 of the issue of December 7, 1872.

To find a tangent passing through a new point, the radius of the curve and the latitude and departure of the point being given:

E P, distance on tangent already run = latitude.
B P, measured at right angles to old tangent = departure.
B being the point and *B D* the tangent sought,
A E = *R* = radius of curve.



1. When the departure is less than the radius, to find the angle *D A E*, which will give the new tangent:

$D\,A\,E = B\,A\,E - B\,A\,D$. $B\,A\,E = B\,A\,C$ by construction.

$$\cot B\,A\,C = \frac{R - B\,P}{P\,E} = \frac{A\,C}{B\,C}. \quad R - B\,P = A\,C;$$

and

$B\,C = P\,E$ by construction.

$$\cos B\,A\,D = \frac{R}{\sqrt{(P\,E)^2 + (R - P\,B)^2}} = \frac{A\,D}{\sqrt{(B\,C)^2 + (A\,C)^2}} = \frac{A\,D}{B\,A}$$

by construction, and $R = A\,D$ by proposition.

Then $B\,A\,C - B\,A\,D$, or $D\,A\,E \div$ degree of curve = length of new curve.

2. When the departure is greater than the radius:

$$B'\,A\,E = 180° - B'\,A\,C'$$

$$\cot B'\,A\,C' = \frac{B'\,P - R}{E\,P} = \frac{A\,C'}{B'\,C'}.$$

$$\cos B'\,A\,D' = \frac{R}{\sqrt{(B'\,P - R)^2 + (E\,P)^2}} = \frac{A\,D'}{\sqrt{(A\,C')^2 + (B'\,C')^2}} = \frac{A\,D'}{B'\,A}$$

Whence $(180° - B'\,A\,C')$ or $B'\,A\,E - B'\,A\,D' = D'\,A\,E$.

3. When the point is found to be to the left of the old tangent, the same principle applies, thus:

$$\cos B''\,A\,D'' = \frac{R}{\sqrt{(E\,P)^2 + (R + P\,B'')^2}} = \frac{A\,D''}{A\,B''}.$$

$$\cot B''\,A\,C'' = \frac{R + P\,B''}{E\,P} = \frac{A\,C''}{B''\,C''}.$$

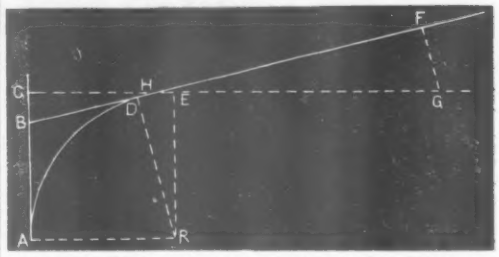
Whence $B''\,A\,D'' - B''\,A\,C'' = D''\,A\,E$.

H.

LIGONIER, Penn., December 10, 1872.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I herewith send you the solution of "R. O. B's" problem:

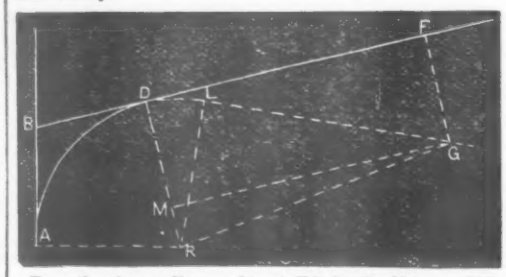


The angle *F H G* is equal to the angle *D R E*. The distance *F G* divided by the distance *F D* will give the tangent of the angle *F H G*, or its equal, *D R E*. Then the angle corresponding to this tangent, or *F H G*, will be the required curvature to be added to *D R A*, that the new tangent may pass through the point *G*. GEORGE L. MILLER.

CATSKILL, December 12, 1872.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The following solution of Mr. "R. O. B.'s" problem in the GAZETTE of the 7th is respectfully submitted for use, should no formula, compact and incomplex, be forthcoming. "R. O. B.'s" diagram with the added lines *GM* (parallel to *DF*) *RL*, (radius at the point where a tangent to curve must leave it to pass through *G*) and *RG* will render an explanation of my solution unnecessary.



From the given radius *r* subtract *FG* for the distance *MR*. Put the remainder down in red chalk.

To the square of *MR* add the square of *MG* (=*DF*): the square root of their sum=*RG*. Chalk *that* down.

Divide *r* by *RG* for sin *LGR*.

Divide *MR* by *RG* for sin *MGR*.

The difference of these angles=the additional curvature sought. SPANDREL.

SPRINGFIELD, Mo., December 16, 1872.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The following is a solution of the problem of "R. O. B.":

Let the distance *DF* in the diagram = the radius, and the

distance FG = the tangent of the angle FDG. To find the natural tangent of the angle FDG:

$$DF : FG :: 1 : \text{natural tangent required.}$$
$$\therefore \frac{FG}{DF} = \text{natural tangent angle } FDG.$$

Then angle CBD + angle FDG (which is equal to angle ARD + FDG) is the angle of intersection of tangents to the curve commencing at A, the tangent of which will, when produced, pass through G.

D. W. C.

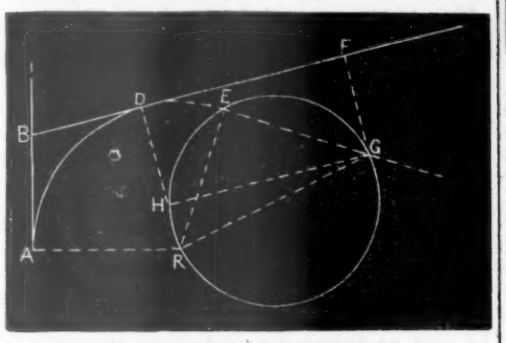
BEAUFORT, S. C., December 13, 1872.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Answer to "R. O. B.," of Albany, N. Y., published in GAZETTE, December 7:

GH parallel to DF, and equal to it. DH and FG equal. $HR = DR - DH$. $GR = \sqrt{GH^2 + HR^2}$. Or, GR as diameter, draw the circle REG, cutting the curve AD produced at E. E is the point of tangent.

The sides of the triangle HRG being found as above, and



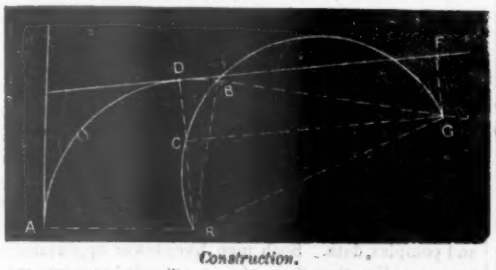
the angle at H being 90°, the angle at R is easily found. In the triangle GER, the sides RE and GR and the angle at E (90°) are known, and the angle at R easily found. *Then the angle DRE, the angle of the curve produced*, is equal to the angle DRG less the angle ERG.

If the angle DRE is 7° and the curve AD a "2° curve," then DE will be 350 feet long; if a 3° curve, 233⅓ feet long.

G. G.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Answer to curve problem in issue of December 7:



Construction.

Produce the given curve sufficiently far, and draw a tangent to it from the point G. Also draw the line CG parallel to DF, preparatory to a

Solution.

In the right-angled triangle GCR, given the lines GC and CR, find the line GR and the angle CRG.

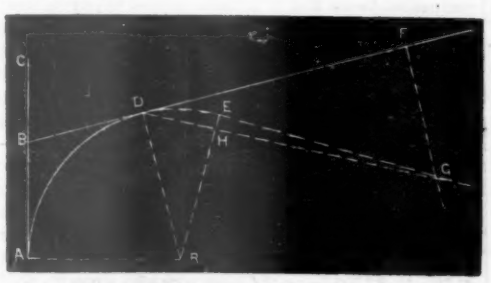
Then, in the right-angled triangle GBR, given the lines GR and BE, find the angle BRG. The difference between the angles thus found will equal the required angle at the center, DRB.

A. H. C.

BEAUFORT, S. C., December 15, 1872.

TO THE EDITOR OF THE RAILROAD GAZETTE:

A day or two ago I dashed off an answer to the problem of "R. O. B.," of Albany, N. Y., in the GAZETTE of December 7, 1872; but on second thought, thinking that "R. O. B." may be in search of a practical solution of his problem, and not thinking much of my own solution as forwarded, I will now send what I suppose nearly every engineer of practical experience would use:



Let the distance $DF = a$.
Let the distance $FG = b$.
Let AD be a 2-degree curve.

One hundred feet advanced from D would be 1 degree deflection from DF, and 1.75 feet deflection from it, which at F would be $\frac{1.75\,a}{100}$ = say, a quantity less than b; then the proportion $\frac{1.75\,a}{100} : b :: 100 : 57.14$; if $a = 10{,}000$, and $b = 100$, then 175 : 100 :: 100 : 57.14 feet.

Then 57 feet, or say 58 feet (as the point E is outside of the ine DG, which distance is also to be overcome), is the distance which the curve should be extended beyond the point D.

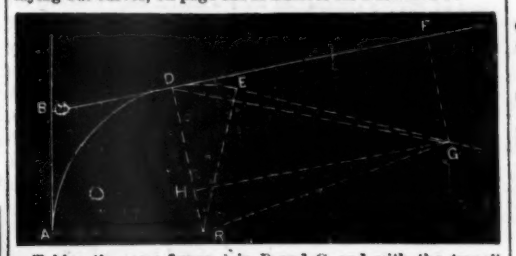
If the quantity $\frac{1.75\,a}{100}$ is greater than b, the proportion would be 100 : 1.75 :: 100 : This is not a "true" solution, but is near enough for field work.

G. G.

ST. LOUIS, Mo., December 16, 1872.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I send the following solutions of "R. O. B.'s" "problem in laying out curves, on page 521 of number for December 7:



Taking the same figure, join D and G, and with the transit at D measure FDG, and make $DRE = FDG$. In nine cases out of ten this is close enough; but the tangent so found will always lie within G and F, but near G if G and R are on the same side of DF, and outside of GF near G if G and R are on different sides of DF. This process repeated, if necessary, from E, will in general be close enough for all cases, if FDG is smaller than the degree of the curve.

This can always be done very readily in the field, and requires no measurement of lines other than DE.

Exact Solution.

Compute RG as follows:

$$RG = \sqrt{HR^2 + HG^2} = \sqrt{(RD - FG)^2 + DF^2}.$$

The angle $DRE = HRG - ERG$.

These angles will be found from the relations

$$\sin HRG = \frac{DF}{RG} = \frac{HG}{RG}$$

$$\cos ERG = \frac{ER}{RG} = \frac{AR}{RG}.$$

$$\text{Exact curvature } DRE = \text{arc sin } \frac{DF}{RG} - \text{arc cos } \frac{Radius}{RG}.$$

C. A. S.

LONG BRANCH, N. J., December 10, 1872.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I send herewith a solution in full of the problem presented by "R. O. B." in your issue of December 7. It is mathematically exact, and the result ng formula admits of almost as easy and rapid application as the methods of *remote* approximation commonly in use.

The increment to the angle at the centre of the curve will evidently be equal to the angle FEG (see "R. O. B.'s" diagram). Calling that angle $2a$, half of it, or the angle DBE, will be a. Calling radius R, and the measured distances, DF and FG, respectively, m and n, we have:

$$\tan 2a = \frac{n}{m - DE}$$

But

$$DE = R \tan a$$

$$\tan 2a = \frac{n}{m - R \tan a}$$

But

$$\tan 2a = \frac{2 \tan a}{1 - \tan^2 a}$$

Hence,

$$\frac{n}{m - R \tan a} = \frac{2 \tan a}{1 - \tan^2 a}$$

Reducing, and solving the quadratic equation, we find:

$$\tan a = \frac{m \pm \sqrt{m^2 + n^2 - 2Rn}}{2R - n}$$

which formula, by simple substitution, gives a value for the tangent of *half* the angle by which the curvature is to be increased in order that the new tangent shall pass through G; or, if the curve is being run in by deflection, a expresses the amount of additional deflection necessary.

The double sign ($\pm$) in the second member will of course give two values for tan a, and hence for a, but there need never be any doubt in practice as to which shall be used.

I have used this formula frequently in the field.

S. SPENCER.

ALLEGHENY STATION, Va., December 10, 1872.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I send you a solution of "R. O. B.'s" problem in the current number of the GAZETTE.

If I be the point of intersection, FI is $a - x$, and FG is b. Then

$$b = (a - x) \tan I \qquad (1)$$

but

$$x = r \tan \tfrac{1}{2} I \qquad (2)$$

Now as up to 16° tangents are pretty regular, I assume. Trautwine-wise, that for our purpose

$$\tan \tfrac{1}{2} I = \tfrac{1}{2} \tan I$$

So (2) becomes

$$x = \frac{r}{2} \tan I$$

Substitute in (1), and

$$b = (a - \frac{r}{2} \tan I) \tan I$$

which, worked out, becomes

$$\tan I = \frac{a - \sqrt{a^2 - 2rb}}{r}$$

and, from (2),

$$\text{the length of curve} = r \tan I$$

At 20° this formula is 4 per cent. too small.

C. E. W.

[Of these solutions, those given by "H," "Spandrel," "A. H. C." and "C. A. S.," and the first of "G. G." are essentially the same, and are correct.

That given by "C. E. W." is, as he says, an approximate solution, and can easily be deduced from S. Spencer's result. For, if in Spencer's result we suppose that n is small compared with m and R, we immediately have

$$2 \tan a = \frac{m + \sqrt{m^2 - 2Rn}}{R}.$$

And making 2 tan a = tan 2 a — tan I, and otherwise changing the notation so as to conform with "C. E. W.," we have the same result as given by him.

The solution given by Mr. Miller is erroneous, or, to speak more mildly, it is approximative. If, in the expression, $\tan 2a = \frac{n}{m - DE}$, given by Mr. Spencer, we make DE equal to zero; we shall have the value of the tangent as given by Mr. Miller. "D. W. C.'s" solution is similar to Mr. Miller's.—EDITOR RAILROAD GAZETTE.]

Lake Shore & Michigan Southern Report.

A report of this company has been made for the year ending September 30, which includes information nine months later than the report to the shareholders. The report shows that on September 30 the company owned 540 miles of main line, with 449 miles of double track and sidings, and 584 miles of branches. This is 127 more miles of double track and sidings and 112 more miles of branches than were reported the year previously. Its equipment consists of 414 locomotives, 124 first-class coaches, 43 second-class coaches and emigrant cars, 77 baggage, mail and express cars, and 8,840 freight cars—an increase of 112 engines, a decrease of 2 first-class coaches, an increase of 10 second-class and emigrant, of 11 baggage, mail and express, and of 2,492 freight cars.

This property was represented as follows:

	1872.	1871.
Capital stock paid in	$50,000,000	$34,906,000
Funded debt	26,338,600	28,433,000
Floating debt	5,992,472	475,946
Total	$80,331,472	$61,846,946

This, for the last year, is at the rate of $74,703 per mile, the stock being $46,555, the funded debt $24,514, and the floating debt $3,634 per mile. The average rate of interest on the funded debt is 7 per cent.

The total cost of road and equipment is put at $64,583,352, against $56,156,722 by the previous report.

The earnings of the road were:

	1872.	1871.
Passengers	$4,064,454 51	$3,946,276 88
Freight	11,848,336 54	9,906,305 61
Other sources	776,816 89	653,465 19
Total	$16,719,339 93	$14,506,047 68

or $15,560 per mile in 1872, against $15,081 in 1870-71.

The working expenses were:

Maintenance of road	$1,380,607 06
Maintenance of equipment	1,684,799 98
Conducting traffic	8,133,103 63
Total	$11,697,180 62

which is very nearly 70 per cent. of the gross receipts. The net earnings of $5,015,200.24 were absorbed as follows:

Interest and leases	$1,977,643 14
Stock dividends (8 per cent. on common and 10 per cent. on guaranteed)	2,810,670 00
Dividends on scrip	134,973 00
United States taxes	56,459 46
Payments to surplus fund	34,994 64
Total	$5,015,300 24

The mileage made by trains was:

	1872.	1871.
Passenger trains	2,545,125	3,972,632
Freight "	6,736,291	6,802,330
Working "	1,059,740	.....
Total	10,330,159	11,774,962

The mileage of working trains seems to have been included in that of freight and passenger trains last year, but altogether there has been a decrease of about 12½ per cent.

	1872.	1871.
Number passengers carried	1,943,163	1,667,169
" " " one mile	141,575,063	148,742,632
Number tons of freight carried	4,283,934	3,561,919
" " " one mile	880,853,169	674,939,194

Thus we see that, notwithstanding the large decrease in train mileage, the decrease in passenger mileage was but 5 per cent., while there was an increase of more than 31 per cent. in tonnage mileage.

Of the tonnage in 1872, about 40 per cent. was agricultural products; 16 per cent. lumber, timber, etc.; nearly 16 per cent. manufactures and merchandise; and 34 per cent. other articles, including minerals, petroleum, etc.

The report enumerates 19 persons killed and 8 injured on the road during the year. Of these, only two of the killed and one of the injured were passengers; eight of the killed and five of the injured employees; the other nine (all killed) being chiefly trespassers on the road.

Montclair.

The rails have been laid to a junction with the Midland at West End, N. J., and the road will be ready for use in a few days. The length of the road from West End to Pompton Junction, where it rejoins the Midland, is about 26 miles, and it extends north of the junction about eight miles to Boardville. The road is leased and will be operated by the New York & Oswego Midland Company, and it is said that the express trains of that company will be run over this line, the distance from Jersey City to Pompton Junction being about seven miles less than by the other leased line, the New Jersey Midland, and the grades on the Montclair also being less. The general route of the road is west through Belleville, Bloomfield and Montclair, and thence north through the Great Notch, Little Falls, Mead's Basin and across the Pompton Plains past Pompton and up the Wanaque Valley to Boardville. It opens a new and exceedingly beautiful hill country to suburban settlement.

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Editorial Announcements.

Correspondence.—We cordially invite the co-operation of the railroad public in affording us the material for a thorough and worthy railroad paper. Railroad news, annual reports, notices of appointments, resignations, etc., and information concerning improvements will be gratefully received. We make it our business to inform the public concerning the progress of new lines, and are always glad to receive news of them.

Inventions.—No charge is made for publishing descriptions of what we consider important and interesting improvements in railroad machinery, rolling stock, etc.; but when engravings are necessary the inventor must supply them.

Articles.—We desire articles relating to railroads, and, if acceptable, will pay liberally for them. Articles concerning railroad management, engineering, rolling stock and machinery, by men practically acquainted with these subjects, are especially desired.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

ERIE'S SETTLEMENT WITH JAY GOULD.

When during the late "Northwestern corner" the Erie Railway Company sued its late President, Jay Gould, for nearly ten millions of dollars, probably very few people expected that the company would get much more than the costs of its suit, though it might put Mr. Gould to a great deal of trouble. It was a colossal claim, and an appropriate act in the great railroad drama (sometimes comedy, sometimes melodrama) which this company has been playing for so many years with so much interest to the spectators and so little profit to itself. Erie suits have been numerous enough, but they seem never to have settled anything. Gigantic wrongs were committed frequently, but the law seemed to provide no remedy, and the courts rather confirmed the steps taken by violence and fraud. We had almost ceased to hope for judicial remedies, and the Legislature was looked to for work which courts should have made unnecessary. So this suit, though backed by strong evidence, was looked upon rather as a means of worrying the defendant than of determining and enforcing the company's claims against him.

It seems to have worried him to some purpose. It claimed that the various purchases of real estate, stocks, bonds, etc., had been made with the money of the Erie Company, which were in the possession of Mr. Gould, and that large amounts received by Mr. Gould from sales of its bonds or shares had never been turned over to the company, and it described these various transactions minutely, and with the help of the books of the firm of which Mr. Gould was a leading member and which made many of the sales for the company.

Mr. Gould's answer to the company's charges, presented in court and published in many of the newspapers, denied that he held the property of the company, or that he had used any of its money for his own purposes. This of course was expected. But what was not expected—certainly not by the public, who had seen Mr. Gould and his associates escape unscathed by the law in so many judicial contests—was the letter of Jay Gould, dated December 17, in which that gentleman offered, "for the sake of peace"(!), to convey to the company property which it claimed amounting nominally to $9,086,000, and including everything claimed by it at the time, it having been shown to its own satisfaction that some of the claims first made were unwarranted or exaggerated. This included real estate in New York, New Jersey, Pennsylvania and Ohio, and stocks and bonds of various companies, the aggregate market value of which is said to be $6,000,000 or more. It includes the Grand Opera House, other real estate used by the company for which it has hitherto paid rent, and, we understand, stocks and bonds of railroad companies leased to the Erie at a high rental, and of supply companies with which it has contracts for material and rolling stock. Mr. Gould's letter said: "I now propose to convey all these properties, previously mentioned, and will in addition convey the Grand Opera House and all adjacent properties owned by Mr. Fisk and myself, the same to be freed by me from all mortgages, to you, on receiving a full discharge from the company. I do this for the sake of peace, because any litigation of such questions is more annoying to me than the loss of the money involved, and because I am sincerely anxious for the success of the Erie Company, in which I have a large pecuniary interest."

Nothing can do this justice but a row of the biggest and blackest exclamation points. We have here Jay Gould in a new part—that of a peacemaker; and not the peacemaker who reconciles two other persons who are hostile, but that most praiseworthy of peacemakers who placates his enemy and does it by the simple but self-sacrificing method of giving him all he wants! Verily this man may be canonized yet, and as St. Jay may become the patron saint of Wall street. Where else will we find a man who will give up not only his own will—reckoned usually a pretty stubborn one—but nine millions of dollars "for the sake of peace?" Ave, St. Jay Pacifex! Only, whose children shall such peacemakers be called?

The Erie Company, of course, accepted Mr. Gould's pacific overtures and his nine millions in real estate and securities, and dismissed its charges. Probably never before in the history of litigation was a suit for so great a sum so quickly and completely successful, and perhaps never was a disputed claim between individuals for so great an amount conceded and satisfied.

Not less extraordinary, and quite as amusing, is the statement published far and wide, and credited by many or most of the leading journals, that Mr. Gould made this settlement and turned over the nine millions in order to profit by the rise in Erie stock consequent thereon! Of course the settlement of a disputed claim for so large an amount, which few outside of the company's directory thought would ever be recovered, increased the price and value of the company's shares; and, of course, Mr. Gould, who knows something about Wall street, and may be presumed to have known that he intended to pay the claim before he offered to, would have been less shrewd than he has the credit of being if he had not bought all the stock he could carry before he proposed the settlement. The reports are that he had secured about 200,000 shares. If this is true, and the property conveyed to the company is worth $6,000,000, the rise in the stock should be $30 a share in order to reimburse him for his sacrifices "for the sake of peace." The rise, however, has been about seven dollars or seven and a half per share, so that Mr. Gould's account, supposing him to have unloaded at the highest price, would stand: Peace, Dr., $6,000,000; Cr., $1,500,000; leaving the total cost to Mr. Gould of that heavenly gift $4,500,000 at date.

That he should have profited by the transaction, even if he had held all the shares of the company, would, indeed, have been impossible, unless the property were more valuable to the Erie Company than to himself. If he had owned all the Erie shares the transaction would have been simply taking the money out of one pocket and putting it into the other. But there are in fact 865,369 shares in the company, and if we divide the six millions of value by this number we will have the exact measure of the increase in the value of each share, namely, a little less than seven dollars.

This is truly a great victory for the Erie management, one apparently legitimately won, and altogether well deserved. The credit of it seems chiefly to belong to Mr. Watson, the President, who coming to the road last July an obscure man, his post as Assistant Secretary of War during the war having been important rather that prominent, his railroad work heretofore having been on lines of local rather than national importance, and his ambition being, apparently, to secure result rather than reputation, has developed administrative abilty of the highest order and a persistent energy which has brought or is fast bringing the ingeniously complicated affairs of the company into order and its administration into intelligible simplicity and under strict discipline. There was hardly a more difficult task possible, but Mr. Watson has given to it such care, patience and ability that he seems likely to perform it satisfactorily.

But we believe that the company has something besides its managers to thank for their success in enforcing their just claims. They might have worked as skillfully and earnestly and secured the same testimony a year or two ago, without inducing Mr. Gould to give up a dollar. So long as a man owns the courts which try his cases, he may defy the law. Mr. Gould owns no courts now. Evidently even he feels himself amenable to the law now. This is a more important matter than the enforcement of justice in this particular case. New York and the whole country have long suffered by the reputation which the old Erie and other litigations gave it. This settlement of an important case will be taken as a virtual acknowledgment that the courts of New York are not now the servants of wealthy and unscrupulous men, ready to protect them in their schemes for plunder, but the expounders of law, ready always to enforce justice, from whom the richest and shrewdest and most corrupt dare not ask the approval of their unlawful acts.

THE QUALIFICATIONS AND PAY OF MASTER MECHANICS.

It is a somewhat singular fact, that of the three officers in charge of the transportation, road and machinery departments, respectively, the one who should have the greatest amount of scientific knowledge, practical experience, mechanical skill and sound judgment combined, is frequently if not generally the poorest paid. It is hard to determine whether this fact is a cause or an effect; that is, whether master mechanics are so poorly paid because they have so few of the qualifications enumerated, or whether their deficiencies are due to the smallness of their pay. The reason for this condition of things is, however, we believe, attributable to two causes: first, and chiefly, because the owners of railroads are ignorant of the value, to them, of the combination of knowledge and mental traits referred to; and secondarily, on account of the immense supply of what are called "practical men" and the comparative rarity of a combination of scientific knowledge, mechanical skill and sound judgment. Such qualifications will always command a high rate of compensation. The exclusively practical man, on the other hand, is limited to a comparatively small field of mental effort. He is capable often of doing very well the things which he has done before, but is of necessity confined to that special kind of exertion. On railroads an immense army of men is constantly in training in the different departments of operation, and thus become "practical men" in the occupation in which they are engaged; but their duties do not call into exercise, or at least to a very limited extent, methods of drawing conclusions from very varied and complex data. Such men have fewer opportunities for succeeding than those of more extended acquirements, and consequently are unable to command so high a price for their services. It therefore happens often that when a man is needed to take charge of the machinery of a road, an immense number, whose training has been only that of practical experience, are ready to accept the place for comparatively small pay. The opportunities for success in other directions present themselves so often to men who have the qualifications for conducting affairs, that it is difficult to retain such in charge of the machinery of railroads at the salaries which are now paid. The result is, that there is a constant tendency to induce the ablest men to leave the service of railroads and go into other occupations. Of course there are always a large number of these employed in subordinate occupations ready to take the places of those above them, so that there is little difficulty in filling the places when they become vacant. It seems strange, however, that railroad companies do not find it to their interest to pay as much for this kind of service as a private manufacturing firm will, or at least enough to make the positions attractive to educated men of first-class ability. The opportunities for realizing mere pecuniary success are now, to an educated man of fair ability, greater, we believe, in each of the professions of law, medicine, and even the church—at least the Protestant church—whose servants have so long been proverbially poorly paid. The salaries of master mechanics who have entire charge of the machinery of railroads vary from $1,000 to $5,000 per year. The latter sum is, however, received by only a very few, $2,500 to $3,500 being the more common amounts paid. Now, to ask a young man to spend from three to four years at a technical school, then as much more in practical training, and after that from five to ten years in employment in some subordinate capacity, in order to have a very uncertain chance of securing an appointment on a railroad as superintendent of machinery, at a salary of $2,500 per annum, is simply absurd. Young men who have their wits about them will not do it; they can secure better employment elsewhere with much less previous training.

The duties of a master mechanic constantly require an

exercise of a very high order of intelligence, and not only that of a mechanical nature, but of scientific and business knowledge.

We have heretofore referred to the fact that the economical use of steam is being rapidly developed into a very abstruse science, and that the laws which are involved are not mere vague theories, but that the use of steam engines is to a great extent dependent upon the knowledge and application of these laws by steam users. Locomotive economy is a subject which would afford a field for the exercise of the highest scientific attainments, and the hardest and most practical deductions of common sense. When a locomotive is exerting its power, it is due to the action of a chemical process in combustion, and the thermo-dynamic effect of heat and steam applied to suitable machinery adapted to the purpose. All these processes bear a very close relation to each other, and must be properly proportioned. The operation of locomotives, therefore, necessarily becomes very complicated, and an error in what the doctors would call "diagnosis" may lead to very great expense and loss. It should be remembered that, while it may be a comparatively easy matter to understand the chemistry of combustion, or as much of it as is now known, and that a little hard study will make the theory of heat and steam comparatively plain, and that practical experience will teach an intelligent mechanic how to construct and repair the purely mechanical parts of locomotives as they are ordinarily made, yet there are constantly new questions arising regarding the relation or proportion of one part or function to others. An inspection of almost any locomotive boiler will reveal a want of careful study or a disregard of the laws which govern the strength of materials, and at the present time the question whether punched boiler plates are weaker than those which are drilled is still undecided. The proportion which the steam ports should bear to the area of the piston is not yet determined, and the use of the indicator on locomotive cylinders is almost unknown in this country. The same is true of the length of locomotive tubes, the form and proportion of boilers, and many other matters which are still open questions. Many of these have a mutual dependence upon each other, and it will be seen how exceedingly complicated these problems become if we reflect upon the infinite combinations which may be effected by varying the parts and proportions of such machines. To come to sound conclusions where such very complicated data are concerned, requires an exercise of the closest and most rigidly logical methods of reasoning. The man who thinks loosely, whose mind is incapable of grasping the whole subject, is very sure to fall into error, and fail in realizing the highest economy where economy is so very important. A master mechanic, therefore, in order to be able to fulfill his duties to the best advantage, should have a wide range of mental acquirement, and well-disciplined habits of thought. These the study of books will cultivate more than any other thing, although many men with only the training which practical experience gives have acquired the faculty of thinking very clearly.

If we look at the subject from another point of view, we will see that the men who have the charge of the machinery of railroads are, in fact, the superintendents of immense manufacturing establishments, which require just as careful and judicious management as similar works of private firms, if they are to be conducted economically. The amount of money expended in the maintenance and operation of the machinery of many roads is now counted by millions. It is quite as easy to disburse this money unwisely as to expend similar sums drawn from pockets less inexhaustible than the treasury of a large corporation. All experienced business men know how difficult it is to have the purchases made advantageously for any large business. This is equally true of the employment of subordinates of all kinds, and also in seeing that they fulfill their duties properly. Only the personal supervision of the chief will exclude drones and oblige the inefficient to perform their duties satisfactorily. What is quite strange is, that men who will not entrust their own business to the care of incompetent men will, when they become directors of railroads, submit the management of a business ten times greater than their own, the duties of which require very much more skill and ability, to the hands of those who are so inadequately paid, that the very smallness of their compensation implies incompetence in doing what, if done well, is worth a high price in the open market. There are men, we know, who from various causes find themselves engaged in the operating departments of railroads, and are ambitious, studious and industrious, who with their daily work manage at the same time to get some mental nourishment, as opportunity or accident permits. Such men are very often clear-minded, intelligent, and well fitted to fill responsible places, and such usually have opportunities of securing more remunerative places in other branches of business. What we are arguing for now is a better and more substantial recognition of the merits of such men, and that railroad managers should recognize their worth by paying them liberally for their services, and thus attract more of the same class into the same occupation.

RAILROAD EARNINGS, NOVEMBER, 1872.

Name of Road.	Mileage. 1872.	Mileage. 1871.	Increase. Miles.	Increase. P. c.	Earnings. 1872.	Earnings. 1871.	Increase.	Decrease.	Per cent.	Earn'gs per Mile 1872.	Earn'gs per Mile 1871.
Atlantic & Great Western	539	506	33	6½	$471,774	$391,376	$80,398		20½	$875	$773
Atlantic & Pacific	328	310	18	5¾	102 940	98,362	4,578		4⅝	314	317
Burl., Cedar Rapids & Minnesota	261	162	99	61	98,592	69,394	29,198		42⅛	378	431
Central Pacific	1,166	1,013	153	15⅛	1,299,991	897,233	402,757		44⅞	1,115	886
Chicago & Alton	650	600	50	8⅓	454,915	455,608		693	0⅛	700	759
Cleve., Col., Cin. & Indianapolis	470	390	80	20	386,614	356,109	30,505		8⅝	823	913
Erie	971	956	15	1½	1,704,374	1,483,454	220,920		14⅞	1,755	1,552
Hannibal & St Joseph	277	277			188,199	252,497		64,398	25½	679	912
Illinois Central	1,109	1,109			681,332	755,436		74,104	9¾	614	681
Kansas Pacific	672	672			310,345	290,230	20,115		7	462	432
Lake Shore & Michigan Southern	1,096	1,038	58	5½	1,525,812	1,345,316	180,496		13½	1,393	1,296
Milwaukee & St. Paul	1,121	1,018	103	10⅛	702 838	644,025	58,213		9	627	633
Marietta & Cincinnati	284	284			207,911	172,567	35,344		20½	732	608
Missouri, Kansas & Texas	610	476	134	28⅛	127,333	111,848	109,415		92⅝	878	998
Michigan Central	715	715			616,624	587,414	28 590		4⅞	864	822
Ohio & Mississippi	393	393			319,159	301,866	17,293		5¾	812	768
Pacific, of Missouri	471	355	116	32¾	296 618	235,103		8,435	2½	698	944
St. Louis, Alton & Terre Haute	266	266			178,252	171,366	6,886		4	670	644
St. Louis & Iron Mountain	285	224	61	27¼	2 2,731	154,427	49,304		32	715	689
Toledo, Peoria & Warsaw	237	227	10	4⅜	103,110	100,831	2,279		2¼	435	444
Toledo, Wabash & Western	628	628			489,341	531,080		41,739	7⅞	779	846
Total	12,549	11,619	930	8	$10,599,154	$9,512,902	$1,276 321	$189,369		$845	$819
Total increase							1,186,952		11⅝		

RAILROAD EARNINGS, ELEVEN MONTHS ENDING NOVEMBER 30.

Name of Road.	Mileage. 1872.	Mileage. 1871.	Increase. Miles	Increase. P.c.	Earnings. 1872.	Earnings. 1871.	Increase.	Decrease.	Per cent.	Earnings per Mile. 1872.	1871.	Inc.	Dec.	P.c.
Atlantic & Great Western	539	506	33	6½	$4,727,012	$4,138,786	$598,226		14½	$8,770	$8,159	$611		7½
Burlington, Cedar Rapids & Minn.	261	159	102	64⅛	911,243	508 360	402,883		79½	3.491	3 197	294		9¼
Central Pacific	1,166	998	168	17	11,978,843	8,794,713	3,185,130		36⅛	10,974	8,819	1,482		16⅝
Chicago & Alton	623	519	104	20	4,830,085	4 889 410		$59,325	1⅜	7,751	9,421		$1,670	17¾
Cleveland, Col., Cin. & Indianapolis	476	390	36	9⅓	4,191,805	3,536,150	555 655		15⅞	9,808	9,067	536		6
Erie	971	956	15	1½	16,963,431	15,981,117	972 317		6⅛	17,460	16 717	743		4⅓
Hannibal & St. Joseph	277	277			2 001,707	2 727,398		635 691	23⅛	7,551	9,846		2,295	23⅛
Illinois Central	1,109	1,109			7,282,461	7,713,013		430,552	5⅝	6, 66	6,955		3e9	5⅝
Kansas Pacific	672	672			3,439 941	3,096 629	324,312		10½	5,091	4,608	483		10½
Lake Shore & Michigan Southern	1,096	1,038	58	5⅓	16,125,556	13,562,690	2,462,866		18⅛	14,822	13,066	1,550		11⅞
Milwaukee & St. Paul	1,121	1,018	103	10⅛	6,443,984	6,217,399	226,585		3⅝	5,748	6 1 8		369	5⅞
Marietta & Cincinnati	284	284			1,825,731	1,520,934	304,817		20	6,429	5,355	1,074		20
Missouri, Kansas & Texas	526	392	131	34¼	1,687,234	892,049	795,185		89⅛	3,208	2,276	932		41
Pacific, of Missouri	471	355	116	32¾	3,3 2 499	3,268,920	33,547		1⅛	7,012	9,209		2,196	24⅛
St. Louis, Alton & Terre Haute	266	266			1,786,309	1,732 186	54,123		3⅛	6,715	6,512	203		3⅛
St. Louis & Iron Mountain	231	212	19	9	2 045,588	1,476,161	569,427		38⅝	8,855	6,966	1,892		27⅛
Toledo, Peoria & Warsaw	237	227	10	4⅜	1,179,361	973,144	206,216		21¼	4 976	4 287	689		16⅛
Toledo, Wabash & Western	628	628			5,476,082	5,219,728	256,354		4⅞	8 720	8,312	408		4⅞
Total	10,904	10,006	898	9	$86,060,842	$86,238,647	$13,947,763	1,185,568	11⅜	8,810	$8,619	$191		0¼
Total increase							9,822,195							

Railroad Earnings for November.

Long as we have waited, we are still unable to give this table its usual fulness even, and we have here reports from only twenty-one roads, the Indianapolis, Bloomington & Western and the St. Louis, Kansas City & Northern being still behind with their reports. The absence of these roads, by the way, increases the average receipts, as both have earnings below the average.

The gross earnings for the month are generally favorable, five companies—the Chicago & Alton, the Hannibal & St. Joseph, the Illinois Central, the Pacific of Missouri and the Toledo, Wabash & Western—showing a decrease, large in the case of the Hannibal & St. Joseph, and trifling in the Chicago & Alton and Pacific of Missouri; and the increase in gross earnings is 11⅛ per cent. The better test of prosperity—the earnings per mile—also shows an increase of 3½ per cent., which, considering the multiplication of new roads and the growing competition which tends to reduce the amount of as well as the rates on traffic, should be considered a satisfactory result. The average earnings per mile are, indeed, absolutely large—at the rate of $10,000 a year. It is noticeable, however, that only four of the twenty-one roads exceed the average, the other seventeen falling more or less below. The Erie, the Lake Shore & Michigan Southern and the Central Pacific do much to keep up the average, the Atlantic & Great Western being only a little above it. Three roads have less than half the average earnings per mile.

While only five roads show a decrease in gross earnings, ten, or one-half of the whole number, show a decrease in their earnings per mile.

For the eleven months our table gives reports from eighteen roads, the Atlantic & Pacific and the Ohio & Mississippi having begun reporting after the beginning of the year, and the Michigan Central having omitted a report for a month or two. The table speaks for itself. There is a gross increase in mileage of 9 per cent., and in earnings of 11⅜ per cent., the increase in earnings per mile being 2¼ per cent. Only three roads, the Chicago & Alton, the Illinois Central and the Hannibal & St. Joseph, show a decrease in gross earnings; but five have a decrease in earnings per mile. The average earnings per mile are at the rate of $9,600 per year.

To Our Young Readers.

We frequently receive letters from young men who occupy subordinate positions on railroads and elsewhere, asking for advice and direction in their efforts to improve themselves mentally. Such persons are usually ambitious to become engineers, and want to learn what books they can read and study to best advantage. It is extremely difficult to give such instruction, as it is impossible for us to know all the circumstances by which such persons are surrounded, their mental characteristics and achievements, or their aims and objects. Occasionally we have letters from boys who want to be engineers, but evidently have very vague notions about that profession or calling. An engineer, to their minds, is a high-sounding title, denoting a person who has charge of various kinds of work of a mechanical character. As engine runners, machinists, persons who direct the location and construction of railroads, the building of machinery, and a very indefinite class of people who undertake to do all kinds of things, all call themselves engineers, it is hard to tell what sort of occupation a young man is aiming at when he wants to become "an engineer." Frequently, and perhaps usually, such persons do not know themselves, and their course will be determined by opportunities and circumstances, over which they have little or no control, as is to some extent the case with all of us. There is, however, a certain kind of mental training which is required or needed by all engineers and mechanics, and is useful in any position of life. As a few words of direction to those disposed to make an effort to acquire some such training may be of service to them, and prevent a waste of time and study, we will devote the space occupied by this article to those readers who may want such instruction, and all others may skip what we have to say.

There is nothing, we think, which should give every right-thinking person so much genuine pleasure as to see those who are in his employ exerting themselves to improve their probably limited education, and no better deed can usually be done than to give such persons encouragement and direction. In such cases the employer can know the mental peculiarities and surrounding circumstances of the persons whom he directs. We, however, can only know what the letters we receive reveal, which is usually very little. It is therefore, as we stated before, difficult to give advice wisely. There are, however, young men on every railroad and in every shop who dream dreams of advancement and mental improvement, and to whom some general directions may not be valuable.

To such, then, we will say that, first of all, the rudiments of an ordinary education are necessary in all positions in life. If a person has not had the advantages of a common school education, the first thing which should be done is to acquire one. Nothing will answer in its place, and ignorance of arithmetic, geography, and such a knowledge of your own language as will enable you to read and write it correctly will be an almost absolute barrier in the way of advancement, beyond a certain point. To those, then, who have not mastered the three primary rounds in the ladder of knowledge, we will say that there is no short road around them. There is only one way, and that is by an earnest, continued and persevering effort to acquire them. The assistance of a teacher and the discipline of a school are

invaluable to those who are disposed to learn these elementary branches. We will therefore spend no more time in giving directions to such, as happily a teacher and school to teach these branches can now be found in almost every nook and corner of our land.

There is, however, a large class of young men with good physical, mental and moral material in them, who have acquired at school and at home the merest elements of an education, and little more. Of such there are large numbers who feel disposed and anxious to increase their knowledge, but must do it in the time that can be spared from their daily and usually fatiguing labor. Having but little time and energy to devote to study, it is therefore more important that such persons should not waste their efforts than it would be if they had nothing else to do but study. In this country there have been so many self-educated men, and so much has been said in their favor, that some persons begin to think that it is altogether better to be self-educated than to be instructed by teachers at schools and colleges. That this is a great delusion and error but little experience and knowledge will prove, and we wish to say as distinctly as we can that wise and intelligent instruction is very much to be desired. An English statesman has said that it is not always wise to try and do the best thing which *might* be done, but the best thing which *can* be done. Now the persons we are writing for are those who are obliged to earn their bread and butter at a comparatively early age, and the only opportunity they have of learning is between their hours of labor. Their study must, therefore, be done either at such times or not at all, and therefore to study under some disadvantage is the only thing that *can* be done.

To such we will suggest that if they can arrange in any way to have a comfortable room in which they can be secluded and not liable to interruption or disturbance, they will find that it will enable them to study to much greater advantage and under fewer discouragements than if they are exposed to the noise and conversation of others. In the next place, if it is possible to get a good instructor, do so; as not only will his aid in explaining what you study be a great assistance, but the fact of having regular appointments with him will prevent neglect on the part of the student, and, to use a railroad phrase, will keep him "on time" in his studies, and to some extent serve to prevent that neglect and procrastination which are sure to steal what little time can be spared if it is left unguarded, or if the old thief has a chance to exercise his vocation.

For those, then, who have a good knowledge of "reading, writing and ciphering," we would suggest the following course of study: first, algebra; second, natural philosophy, or physics; third, free-hand drawing. We must here, however, especially direct attention to the fact that the value of undertaking these studies will be *entirely* dependent upon the success of the student in achieving what he undertakes. Merely to buy books, form good resolutions, engage a teacher and then break down entirely, is cowardly and demoralizing, and works more evil than good, as it is a characteristic of our natures that when we undertake to do a good thing and fail by our own fault, we are morally weakened, and lose somewhat of that vital force of character which is the motive power of right living. We want therefore to impress upon the reader the necessity of perseverance and persistence. If you once undertake to learn what we have named, hang on until you understand thoroughly what you are studying. We believe that what a person will be able to achieve in after life is often determined with considerable definiteness, and that the character often takes a permanent impression, either of endurance or flaccidity, in either achieving or failing in such an undertaking. We therefore urge those whom we are addressing, as they value their future welfare and their strength of character, not to break down in any such endeavor in which they may engage.

It is also sometimes an element of weakness of purpose when persons refuse to engage in any effort from the fear that they may not be able to carry out what they attempt. Courage is quite as necessary as persistence for persons who educate themselves, or who succeed in learning more than they knew. In undertaking a course of study it is, however, important for the student to realize how *little* time he can control, and how *much* is needed for what he wants to know. They are, therefore, cautioned against undertaking too much, and in suggesting studies, we have been careful not to propose more than most intelligent young men can accomplish without much difficulty and within a reasonable time. In selecting text books of algebra and natural philosophy, they should choose small elementary books and not large treatises. Any respectable school teacher will be able better than we are to recommend the best books for the student. Young persons are prone to undertake great tasks, and if such become enamored of knowledge, they are apt to make plans without realizing the effort required to carry them out. It is better to undertake a moderate task and accomplish it than to boast of doing much and fail. If a student will simply take up the two studies we have named, and by dogged perseverance will in winter evenings and in spare hours learn them thoroughly, he will both by the effort he has made, and also by what he has learned, have laid the basis on which he may successfully build a good education.

After—and not before—he has done this, he should take up geometry, mechanical-drawing and chemistry. By studying geometry a student can, with the aid of a good text-book and without the help of a teacher, study mechanical drawing. The best book on the latter subject is a costly one and is now, we believe, out of print, but was published by Blackie & Co., of Edinburg. D. Appleton & Co.'s "Practical Drawing-Books," numbers I and II; "Minifie's Drawing-Book," and "Drawing for Machinists," by Cassell, Petter & Galpin, are the best books we know of. Either one of these will give the student, if not all, at least a great deal of the information he needs.

The studies which should follow these are, some more advanced book on physics or natural philosophy, logic, mensuration and trigonometry, and a continuation of mechanical drawing. If the student studies successfully what we have planned for him, he will then need no more directions to guide him, excepting possibly some suggestions regarding what books he should read, of which we will speak in a future article.

We will conclude this, however, by calling the attention of young men to the demand, which they seldom realize, for intelligent, honest and faithful men in all positions and occupations. Five minutes' conversation with any business man will reveal to you that one of his chief difficulties is to get competent assistants. It is so everywhere, and on railroads especially. Young men usually cannot see that the reward of intelligence must and does come *after* its acquisition, and not before. They want the reward offered before the service is rendered, and often will not believe that there is any reward excepting that which comes by "luck." They may be assured, however, that the world never offers rewards for stupidity, and probably never will, and that the most certain way to secure desirable positions on railroads or elsewhere is to be qualified to fill them.

The Cairo & Vincennes Railroad.

This railroad, whose completion was celebrated by an excursion from Vincennes to Cairo on the 16th of December, is a work of more than local interest, inasmuch as it is intended for through traffic rather than local, and may form a part of a line from the extreme southwest to the extreme northeast of the country. The line is 157 miles long, and may be said to be parallel with and nowhere distant from the Ohio and Wabash rivers, the route being nearly due northeast from Cairo to Vincennes. The country on the line was almost the first part of Illinois to be settled, but it has not grown very fast, and, though fairly prosperous, does not compare with Central and Northern Illinois in wealth and population. The country near the streams is level and very fertile; elsewhere it is broken, hilly, rocky, and well timbered, excellent for fruit, which matures early, the district being in the latitude of Southern Virginia. About eight miles of the road, from Vincennes southward, is in Indiana; thence to Cairo it is in Illinois. Vincennes claims about 7,000 inhabitants, and, with the exception of the other terminus, is the only important town on the road. Mount Carmel, 24 miles from Vincennes, has about 2,500 inhabitants; Grayville, 17 miles further, about 1,800; Carmi, at the crossing of the Evansville line of the St. Louis & Southeastern, 1,500; Harrisburg, 1,500; Vienna, 450; and Mound City, 2,000. All of these are county seats.

The road is virtually an extension of the Indianapolis & Vincennes Railroad, 117 miles long, which has been in operation for a few years and is leased to the Pennsylvania Company, which has, in consideration of having guaranteed its bonds, the right to lease the new road also. The two roads together form a line of 274 miles long from Indianapolis directly southeast to Cairo. With the Pennsylvania line eastward this completes a route 1,099 miles long from New York to Cairo. This is 35 longer than the route to St. Louis.

The road opens a new eastern route from Cairo, and not only a new one, but the only one distinctively eastern, as its only other road is the Illinois Central, which connects with the Ohio & Mississippi 120 miles above, and with the other lines from St. Louis eastward further north. The new road will be interested in encouraging shipments by rail eastward from Cairo, and will doubtless compete for a share of the traffic arriving by the Mobile & Ohio and the Mississippi Central, as well as by the Mississippi River steamboats. It will also be able to compete with the Elizabethtown & Paducah for the eastward traffic of the Paducah & Memphis road by constructing a branch a few miles long. This is not altogether a very large traffic now, but it grows, and the new road will give it some advantages not heretofore existing. More, perhaps, is to be hoped from connections beyond the Mississippi, if a friendly connection is made with them, as seems probable. The Cairo & Fulton road will extend in exactly the same direction with the Indianapolis & Cairo line, and the International of Texas will be a further continuation, so that altogether they will form a continuous line about 1,250 miles long from Indianapolis due southwest to the Rio Grande. And this is not a mere project, for the Cairo & Fulton is nearly completed to Little Rock and in progress beyond, and about 175 miles of the International is in operation. At present the Cairo & Fulton is connected with St. Louis and not with Cairo; but we believe the Cairo connection is to be made, and to take the Eastern traffic by way of St. Louis will require a considerable detour.

Work was begun on the road just completed as early as 1857 by the "Illinois Southern Railroad Company," which expended about $200,000 on the line about that time. The new company was chartered in 1867, with Gen. Ambrose E. Burnside as President. Work was begun soon after, and considerable municipal subscriptions secured; but again the work was suspended. At last the company secured the Pennsylvania Company's guarantee and a market for its bonds, and let the contract to Messrs. Winslow & Wilson, who, beginning last April, have now completed the work. This was by no means light. There are 1,850 feet of Howe's truss bridges, 18,000 feet of pile and trestle bridges, and a tunnel 1,005 feet long through shale and sandstone. Only two miles from this tunnel the road runs over trestle work 400 feet long and in the highest part 80 feet high.

The officers of the company are: General A. E. Burnside, President; Colonel D. R. Larned, Treasurer; Captain Roswell Miller, Secretary; Colonel E. C. Rice, Chief Engineer. Since the road was turned over to the President by the contractors (on the 16th inst.), Gen. E. F. Winslow has been appointed General Manager, Mr. John Lee, who was Superintendent of Transportation during construction, Superintendent, with headquarters at Carmi, and Charles O. Wood, Assistant Superintendent, at Cairo.

Record of Track Increase.

This number of the RAILROAD GAZETTE has information of the completion of new railroad track, as follows:

Chesapeake & Ohio, extended from Kanawha Falls eastward and from Hinton westward, in all 44 miles. *Milwaukee & St. Paul—St. Paul Division*, completed by the extension of the track southward 9 miles to La Crescent, Minn. *Marquette, Houghton & Ontonagon*, completed by the laying of track on 8 miles west of Lake Michigammi, Mich. *Montclair*, completed by the laying of a mile of track to a junction with the Jersey City end of the New Jersey Midland. *Buffalo, New York & Philadelphia*, completed by the laying of 5 miles of track north of Emporium, Pa. *Burlington, Cedar Rapids & Minnesota—Pacific Division*, track laid from Vinton west to Dysart, Ohio, 16 miles. *Toledo, Tiffin & Eastern*, completed from Tiffin northwestward to Toledo, Ohio, about 45 miles. *New York & Oswego Midland—Norwich & Auburn Division*, extended from Venice Center northward 16 miles to Scipio Center, N. Y. *North & South of Georgia* (narrow gauge), track laid from Columbus, Ga., northward 20 miles. *Paris & Decatur*, completed from its junction with the Chicago & Illinois Southern at Mount Zion, Ill., westward 9 miles to a junction with the Illinois Central below Decatur and near Wheatland. *Pennsylvania & Delaware*, completed from Delaware City northwestward 7 miles to a junction with the Delaware Railroad near Rodney, Del. *Canada Southern*, 32 miles of track has been laid, completing the gap between Amherstburg and St. Thomas.

This is a total of 212 miles of new railroad.

THE UNITED STATES has been a great railroad builder almost from the very first. As early as 1832 it had twice as much railroad as all Europe, having then 576 miles, while Great Britain had 116, Austria 117, and France 46 miles. It continued to surpass Europe in its mileage until 1844, when this country had 4,522 miles and Europe 4,904. Europe has kept its position since that time, though several times the figures have been very close; and, though it had 80 per cent. more in 1849, it had little more than 2 per cent. more in 1857, and at the close of 1871 had about 10 per cent. more. The rates of increase since our war compare as follows:

	Europe.	United States.
1866	7.75 per cent.	4.37 per cent.
1867	5.12 "	5 92 "
1868	6 52 "	8 88 "
1869	5.33 "	15 59 "
1870	8.65 "	11 61 "
1871	7.88 "	14.87 "

This is according to German statistical tables, which are probably quite exact so far as Europe is concerned, but certainly are not entirely exact for the United States. Indeed, accurate statistics of the railroad mileage of the country for the different years do not exist, we believe. But the figures given approach the truth, at least. The extraordinary activity in railroad construction since 1868 is striking, and it has continued through 1872. At this rate we shall soon again surpass Europe in railroad mileage, if, indeed, we do not at this moment.

THE CREDIT MOBILIER OF AMERICA, according to what purports to be an official list of the stockholders, dividends and allotments, paid on each share within a year and 17 days $155 in the company's bonds (which sold nearly at par), $90 in cash, and $300 in the stock of the company. The latter at the time was hardly a marketable property, but altogether the rate of profit seems not to have been unsatisfactory to men of moderate desires. This list accounts for 36,712 shares, held in the names of 93 different persons, the only prominent politicians among them being John B. Alley (200 shares), Oakes Ames (1,935 shares) and James W. Grimes (330 shares). A majority of the shares (18,690) was held by nine men, whose names and holdings were as follows:

	No. Shares.		No. Shares.
Oliver Ames	4,680	Griswold G. Gray	1,620
Oakes Ames	1,935	R. G. Hazard	1,690
Thomas C. Durant	4,914	Cyrus H. McCormick	945
Sidney Dillon	1,005		
John B. Daff	1,883	Total	18,690

These names will most of them be recognized as those who were prominently connected with the company since as well as during the construction of the road. Not many railroad men appear in the rest of the list.

According to this report, Dr. Durant's cash and bond dividends amounted to a little more than $1,200,000, besides stock now salable for more than $500,000; Oliver Ames received $57,500 less in stock and bonds, and stock worth less by about $27,000, and so on.

THE VIENNA EXHIBITION bill, appropriating $100,000 for the official representation of the United States, has passed the House, and will probably now pass the Senate with but little delay. General Van Buren, the Commissioner, considers the amount entirely inadequate.

Technical Education—Views of Mr. Joseph Harrison, Jr., and Mr. Coleman Sellers.

On the 11th of October last, the building erected for the Department of Arts and Sciences of the University of Pennsylvania was formally dedicated. A large number of eminent instructors and prominent citizens of Philadelphia were present, and the speeches of two of the latter we give below, as illustrating the opinions of experienced manufacturers on the subject of the value of technical education in schools and colleges:

SPEECH OF JOSEPH HARRISON, JR.

Mr. Provost, Professors and Gentlemen:

It may not be out of place when we consider the past and present importance of the University of Pennsylvania, that outside people should give utterance to such ideas as they may hold on the subject of education.

I may in some degree entertain heterodox views on this sub-

ject, and, with all deference to yourself, Mr. Provost, to the faculty of this institution, and to this company, I willingly leave them with you for what they are worth, and do not in any way invite or desire discussion.

That education of some kind is of value to all, and absolute necessity to many, need not be pointed out or insisted upon at this day; but we may well consider what kind of education will most conduce to the best uses of the individual in the varied walks of life.

In one case, the youth who is well to do in the world, and has no apparent need to concern himself as to his means of living in the future, may desire, and may look toward attaining, a very high standard of education, not for the purpose of using it for his material benefit in the battle of life, but because he feels that it will be a pleasure to him to *know*—that it will be discreditable to him to be *ignorant*—the University of Pennsylvania is the place for him.

Another with a natural bent toward abstract science, with what is called genius too, if you please, and with a full understanding that what he may acquire in the schools *must* be his means for future support, seeks the spot where such necessary knowledge can best be found. The University of Pennsylvania is the place for him!

I have been speaking of the few, in the great mass of humanity; one class heaping up knowledge as a gratification and an ornament, and that other class, whose opportunities make it possible to turn their acquirements to account in the learned professions, as well as in other pursuits needing such knowledge, and thereby conducing to their pleasure as well as to their profit.

Let us now glance toward the practical toilers of our race, that greater number who fill the ranks of the grand army of producers; they who must strain body and brain to the utmost to first conquer a living, and from whose number in the past, as in the present, are recruited in almost every instance the managers and masters of our great industrial establishments.

Equal, perhaps, in all respects with those who bear off the honors at college, they seldom have time to spend at school after fifteen or sixteen, and they or theirs as seldom have means to spare above their ordinary wants. The University of Pennsylvania is no place for them.

A good deal is written and said in these days about a higher standard of education for those who fill the third place in this category—that they should be taught chemistry, mathematics, and the other abstract sciences, so as to better fit them for the work in which they must strive to make a living.

I doubt very much the necessity or the value of these acquisitions, and I think, under the present condition of things, that the preachings and in part the practices of the hour are toward too high a standard of education for the man who must, *perforce*, start in life with the stern necessity of earning his daily bread without needless loss of time.

Keep him too late at school, and it will be perhaps too late for him to learn a trade. Keep him too late at school, and he will beget a distaste for such useful work as will best tend toward furnishing him with the means to live.

To my mind the very best knowledge that a young man can have at twenty-one, situated as I have just described, is that which he can turn to the best and most profitable account—that which will always be in demand.

"Oh!" exclaims one, "you cannot make good makers of machinery without this higher education, nor can you make a good dyer or founder without a full knowledge of the chemistry or the metallurgy that bears upon his trade." True, in the main; but do not flatter yourself into believing that all those who achieve distinction in the industrial arts come from the number of those most highly educated, in the common sense of these terms.

That they might more easily have become masters and managers in their varied vocations had they possessed, at the outset of their career, the knowledge of a graduate of this University, or of the Philadelphia High School, is possible, but the chances might have been that those who fill the highest and most profitable places to-day might never have achieved distinction at all, in their callings, had they been kept out of the workshop until at or near their manhood. Too much education might have marred their fortunes for life.

In mechanical and other trades, it is the education of the workshop, and not the education of the schools, that is most required.

Teaching by the rule of thumb, as some call it, or rather by manipulation and practical application, is more needed by the mechanic and artisan at this day than theoretical science.

The most distinguished men now engaged as masters in the industrial arts are not from amongst the graduates of universities or high schools, and I fear that they will never be found, as a general rule, with those who have won high scholastic honors. Polytechnic schools, and such workshops as are sometimes found in colleges, can never make the first-class practical workman.

If you will scan the wide field of the mechanic, the engineer and the manufacturer, you will find, with but few exceptions, that at the present moment the ruling minds are from the class of the early and persistent toilers in the workshop, and it seems necessary, for developing the mind in practical things, that this kind of early training, this rough-and-tumble sort of discipline, must be encountered at first, to prepare the man for the better and higher work thereafter.

Ask those who are engaged in making improvements in machinery, and from whose labors the world is now so largely benefited, how much *they* depend upon the higher and more abstract branches of science. They may have learned in early life a smattering of mathematics only to be forgotten; but when they need abstract calculations or elaborately finished drawings, they get others to do them. Their time is worth too much for that.

And, again, in the use of a material like iron; the theorist boasts, over his apparently unlearned competitor, that his calculations are made to a decimal; but the former has not yet learned that there are hidden blow-holes in cast iron, and hidden defects in other material, as well as other most important influences not calculable, that, if not allowed for, will set at naught all these nice calculations, and his work will be thus rendered worthless. An intuitive idea of proportion comes from practice in the workshop, which cannot be learned in the schools.

There is much that bars and hinders the learner, and a full supply of skilled labor is now a most crying want. Let us not keep the lad who must earn his own living out of the workshop by keeping him too long at school, thereby losing valuable time in acquiring a kind of knowledge that he seldom or never can use.

As in the past so it will be in the future, the bright boy and the brighter man will fill the best places as managers and masters. Mediocrity and stupidity will find their level, and they will continue to lament that they never had a chance.

SPEECH OF COLEMAN SELLERS.

Mr. Chairman—It is impossible for me to express in fitting terms the feelings excited within me at the connection of the name of the Franklin Institute with that of this University. I heard to-day that exceedingly interesting description of the beautiful windows that adorn your chapel. Prominent among those windows is that which is intended as a memorial of Franklin. In the matter of education Franklin stood pre-eminently forward in this country; and the Franklin Institute has endeavored through its whole course since its origin to educate the mechanics of the city of Philadelphia. All connected with that Institute have felt the need of some place where those who desired to succeed as mechanics should have, what some of us too much lacked, the means of obtaining a liberal education.

I have heard this evening the remarks of my friend, Mr. Harrison, and I must say that I feel constrained to differ with him in some respects with regard to the kind of instruction that mechanics should receive. There are now throughout this country many eminent men who are prominent as mechanics. If you inquire into their career, you will find, in all probability, that they had but a simple common school education; but my word for it, sir, they have, every one of them, regretted that they had not the means of obtaining knowledge that is now offered by this noble institution. (Applause.) I myself have felt this deeply. Leaving school at the early age of fifteen to work upon a farm, and then finding my way as best I could into the workshop, all the time I could spare has been devoted to acquiring in after-life that knowledge, the foundation of which should have been given to me when I was young. I see in my own children—I think of it every day—that what is wanted is some means to make those who are to be the leading mechanics of the country cultivated, well-educated men (applause); make them, not as I am, afraid to address an audience like this, but able to come forward and feel that they are speaking properly, at least, their mother-tongue.

Now, it is natural for all mechanics to think of that which produces a result in the light of a machine; they feel and know that when a need exists for the production of a certain machine, it is usually created. Pardon me, sir, for speaking of this great University of Pennsylvania as a mechanism, the object of which is to shape, to mould, minds into usefulness. There has been a need of this very machine, considered as a means of education; and it has been created not entirely new, but to the old parts new movements have been added to meet the requirements of the times. I see in it something far better than the so-called technical institutions of the country. I see science walking hand in hand with art. I notice that those young men who come here and enter the scientific course at once feel that they must endeavor to acquire something more than mere technical knowledge. I find that invariably, while they are anxious to acquire the knowledge that will aid them in their profession, still they want to listen to the worthy Provost in his instruction; they want to go to those professors who will teach them something beyond demonstrations in the particular branches they are about to pursue. They feel that if they can acquire that kind of education which will fit them to express properly what they know, they will be of more use to the community. I must say that the educated mechanic needs, beyond all things, mathematics as a basis. I never have believed in the "rule of thumb." I never have believed in that intuitive perception which would enable a person to shape a machine without a knowledge of the laws that govern matter and regulate its durability. For my part I have not got it. I feel that, step by step and cautiously, each part must be measured and each part must be adapted to the purpose for which it is to be used, by careful mathematical calculation. I notice now, talking day by day to the students who are attending these halls, that that kind of information best needed for the mechanic is being imparted to them, and at the same time I feel that they are getting a taste for something which is more beautiful. They have awakened in them the poetry of words, of art, and of nature; and I can see, in the instruction they receive in the earlier part of their career, when they enter as Freshmen, and while their studies run parallel, as it were, with the tuition imparted to those designed for the learned professions, that they there learn what is needed to enable them to properly express in language what they may afterwards acquire in science.

I can hardly find words to express the respect and esteem I have for this University. I feel that it must succeed. I see in it features better than in any institution of the kind in the world. And I feel confident that the citizens of Philadelphia will come forward promptly to aid the gentlemen who are so nobly and so diligently exerting themselves to perfect this great school, and give them the means to make it a decided success. [Great applause.]

Report of the Rome, Watertown & Ogdensburg Railroad.

The report of this company for the year ending Sept. 30, 1872, gives the length of the company's lines as 189½ miles, 141 being the main line from Rome to Ogdensburg, N. Y., northwest 42 miles to Richland, northeast thence to DeKalb Junction, 80 miles, and thence northwest 19 miles to Ogdensburg; 24¼ the branch from Watertown Junction north to Cape Vincent, and 24¼ the branch from DeKalb Junction northeast to Potsdam Junction, N. Y. The company also works the Oswego & Rome Railroad, from Richland (42 miles from Rome) west to Oswego, 28½ miles, but seems not to have included this in its report.

On this road there was 21 miles of double track and sidings.

At the date of the report the company owned 40 locomotives, 31 first-class passenger cars, 15 baggage, mail and express cars, 739 8-wheel and 60 4-wheel freight cars—1 locomotive, 2 first-class cars, 2 baggage, mail and express cars, and 101 8-wheel freight cars more than reported the previous year.

This property at the date of the report was represented by $2,998,900 of capital stock, $1,735,606.10 of funded debt and a floating debt of $38,359.49, there having been during the year no change in the amount of stock, an increase of $205,659.35 in the funded debt, and of $29,117.55 in the floating debt. The interest on the funded debt is 7 per cent. The capital stock is at the rate of $15,825, and the funded debt $9,160 per mile of road.

The train mileage and amounts of traffic are reported as follows.

	1872.	1871.
Mileage of passenger trains	313,362	321,106
" " freight trains	342,654	284,057
No. Passengers carried one mile	12,435,440	14,838,912
No. tons of freight " " "	22,451,830	17,890,061

The receipts were:

	1872	1871
Passenger	$417,518.40	$483,566.29
Freight	657,055.22	682,822 72
Other sources	76,190.75	73,126.45
Total	$1,150,764.37	$1,239,515.46

The report for 1871 included the receipts from the Oswego & Rome roads.

For the last year the earnings are at the rate of $6,073 per mile of road, against $5,909 the previous year, the increase being 2¾ per cent.

The expenses were:

	1871
Maintenance of road	$336,318.11
Maintenance of equipment	169,188.96
Working the road	371,157.26
Total	$868,658.32

which is nearly 75½ per cent. of the gross receipts,

The net earnings were thus $282,106.01. The payments of interest ($108,696.84) and a 7 per cent. dividend on stock ($209,923) exceeded the net earnings by about $36,500.

The company reports three persons killed on the road during the year, all employees.

Report of the Rensselaer & Saratoga Railroad.

The Delaware & Hudson Canal Company (lessees since May 1, 1871, of this railroad) report as follows for the year ending September 30, 1872:

The company owns a line from Troy northwestward 26 miles to Ballston, N. Y., and thence northeastward by way of Saratoga and Whitehall to Rutland, Vt., a total of 95 miles; with a branch from Albany Junction (6 miles above Troy) south 12 miles to Albany; a branch from Ballston southward 16 miles to Schenectady, N. Y., a branch from Fort Edward west 5 miles to Glenn's Falls, a branch from Whitehall to Lake Champlain, 2 miles, and a branch from Castleton, Vt., southward 51 miles to Eagle Bridge, where it forms a connection with the Troy & Boston Railroad 23 miles from Troy. It possesses the only approach to Saratoga, and, from the south, to Lake Champlain, two routes from Albany to Rutland, and thus commands during the summer a large and profitable pleasure travel; while its Schenectady line connects the coal fields of Pennsylvania by a short route over its own lines with these lines and those of Vermont.

On these 181 miles of railroad there was 41½ miles of second track and sidings.

The equipment was:

	1872.	1871.
Locomotives	59	56
First-class passenger cars	50	46
Second-class passenger cars	18	20
Baggage, mail and express cars	19	17
Freight cars	974	850

This property was represented by $6,000,000 of stock, and a funded debt of $1,925,000, bearing 7 per cent. interest. There has been no change in this capital account during the year. The stock is at the rate of $33,150, and the funded debt at the rate of $10,635 per mile of road.

The construction and equipment accounts show an increase of $498,642.61 during the year.

During the two years last past, the work of the road is reported as follows:

	1872.	1871.
Mileage of passenger trains	310,857	296,139
Mileage of freight trains	477,151	355,370
Mileage of working trains	43,466	72,017
Passengers carried one mile	17,211,206	16,868,835
Tons of freight moved one mile	29,451,799	22,146,373

The earnings were:

	1872.	1871.
Passengers	$661,433 11	$633,973.44
Freight	961,944.31	828,705.11
Other sources	125,537.83	115,015 68
	$1,748,915.25	$1,576,694.23

Or $9,662 per mile in 1871–72, against $8,711 the previous year, the increase being 11 per cent.

The working expenses were:

Maintenance of road	$487 950.95
Maintenance of equipment	136,100.09
Working the road	520,610 56
Total	$1,144,691.60

Or about 65½ per cent. of the net earnings. These expenses were $1,135,572.36 the previous year. The net earnings were thus $604,223.65, of which $134,750 was absorbed by interest on the bonded debt, and $420,000 by a 7 per cent. dividend on the stock, leaving a balance of $49,473.65.

The company reports for the last year seven persons killed and four injured during the year, one of the killed and one of the injured being passengers, three of the killed and one of the injured employees, and the others being persons who were struck by trains while walking on or crossing the track.

Report of the Boston & Providence Railroad.

The company's road extends from Boston to Providence, 44 miles. It owns also the West Roxbury Branch, 5 miles, the Dedham Branch, 2 miles, and the India Point Branch, 7½ miles; and leases the Stoughton Branch, 4 miles, and the Attleboro Branch, 4 miles. It thus works 66½ miles of road.

For the year ending September 30, 1872, the report shows the property represented by $3,550,000 of capital stock, there being no funded debt, and very little floating debt. The construction and equipment account was $3,906,538, and the company had other property, amounting to about $840,000.

The receipts were:

	1872.	1871.
Passengers	$892,861 38	$761,517 98
Freight	772,738 41	604,196 39
Other sources	61,399 63	48,161 89
Total	$1,716,399 42	$1,413,876 26

or $25,810 per mile of road in 1872, against $21,261 in 1871. The total increase is $302,523.16, or 21½ per cent., over the receipts of the preceding year.

The expenses, including large expenditures for improvements and additions to the property (including $156,060 for new equipment), were $1,251,152.09, nearly 73 per cent. of the receipts. Out of the balance of $465,246.83, two 5 per cent. dividends were paid, and there remained something more than $70,000 to add to the previous year's surplus, making the amount $822,922.38, which would suffice for a 20 per cent. dividend on the stock. Four new stations were completed during the year, and three were begun, and preparations were made for the speedy completion of a great passenger house in Boston. A third track, especially for the accommodation of suburban traffic, was completed over part of the line and put in operation, and six new trains were put on the line, adding to the expenses materially. Arrangements were made by which the Stoughton Branch might be secured,

Railroad Contracting in England.

We copy the following from one of a series of articles on the "History of Railways" now in course of publication in the *Railway Service Gazette*. The reader may notice that a contract system common here now is similar to one described as past in Great Britain:

We gave a sketch in our last of the navvies, and we shall now supplement it by an outline of the important system of contracting which has played such a large and leading part in the history of railway construction, and which now began to assume considerable proportions. The beginning of contracting was but humble. In the early days about half a dozen miles of earthworks, fencing and hedges formed the average of responsibility undertaken by a single contractor, but, ere many years, it was comparatively common for one man to hold himself answerable for the construction of an entire railway, and deliver it over complete to the company. Then, of course, the system of subcontracting to an indefinite extent followed. Great capital was necessary, and large profits were earned by the great contractors. Probably never in the history of the world has any one class of traders or manufacturers—for they belong equally to both classes—so rapidly risen from such small beginnings as the Brasseys, the McKenzies and the Salamancas. One peculiarity about the nature of the business of contractor is especially worthy of notice. So long as he remains in business he cannot for any considerable period permit his capital to be idle, for his plant is so enormous that were it to remain idle, it would eat away very much of the profits of even his most successful ventures. Hundreds of earth wagons and horses, scores of miles of rails and sleepers for "temporary way," several locomotives and stationary engines, tools of countless number and endless variety; these, in addition to enormous accumulations of timber, brick, stone, rails and a host of other materials are, of course, all lying idle when the contractor has no works on hand.

In such cases, although the navvies can be gradually diminished as works approach completion, and involve no eating up of capital so far as they are concerned, the contractor must have a very large staff of scientific, commercial and skilled employees, whom he must keep in permanent employ or pay, else the whole work of superior organization and drill would have to be re-undertaken when every new enterprise was inaugurated. This, of course, would be as impossible as it would be irksome and costly, and hence it is that the contractors are constantly pressing forward new undertakings, being willing frequently, so long as they can secure employment for their brains, capital and staff, to accept in very large proportions shares of new enterprises in part payment of their services and expenditure. The same inducements produced this other result, that they themselves projected undertakings, and used parliamentary influence to have them legalized, and employed their private influence among their own circle of connections and dependents to have sufficient shares taken up to induce Parliament to pass the bills in which they were interested. Thus, in very many cases, the original relations between the contractor and the promoters and shareholders of a given measure were reversed. They inaugurated and endeavored to induce the public to carry out their own plans, instead of the public promoting and then calling in the contractors' services for the realization of the project proposed. These, however, were proceedings which we may now speak of in the past tense, as at the present time the construction of very few if any railways is undertaken by contractors on such terms.

This second development of the contracting system was productive of both good and evil. On the one hand, this restless, stimulating desire for employment doubtless facilitated the accomplishment of many enterprises whose course would otherwise have been far less smooth, or whose inauguration might have been delayed till long after the period of their actual accomplishment, and many of which would probably not have been heard of even to this day; but, on the other hand, it must be borne in mind that this insatiate craving for contracts has caused the construction of a great number of comparatively useless and valueless railways, although it is possible that in the next generation, by increase of population or other causes, they may become both useful and valuable.

The beginning of the contracting system, as we have said, was but humble, and was commenced by the late Mr. Brassey, for a part of the Grand Junction line; but in the course of years he thought nothing of contracting for the construction of a thousand miles, or of undertaking responsibility to the extent of many millions on his own account, and equally large sums in conjunction with his partners. At one time he is said to have had contracts in hand to the amount of sixty millions sterling. The following authenticated incident is recorded of Mr. Brassey, and remarkably illustrates that indomitable perseverance and high sense of honor which equally conduced to his astounding success. He had a contract for the construction of the line between Rouen and Havre, and had built a bridge of twenty-seven arches, costing £30,000. During the progress of the work he repeatedly protested against the quality of the material supplied to him. The bridge fell down, the bad foundation of the bridge being the best proof of the good foundation of his complaint. His friends assured him that there was not the slightest moral claim on him for its reconstruction, and his lawyer told him that there was an equal absence of any legal responsibility; but he said, "I have contracted to make and maintain the road, and no law shall prevent Thomas Brassey from being as good as his word." He rebuilt the bridge out of entirely new materials, and although sixteen millions of bricks were necessary for its reconstruction, fourteen millions of which had to be made on the spot, the work was completed in seven months. Mr. Brassey died about two years since, leaving the enormous fortune of four millions sterling to his family.

Another great magnate among railway contractors was Sir Morton Peto. His earliest railway work of large bulk was the Cambridge portion of the Eastern Counties, constructed about 1843. Sir Morton Peto did not commence life, or even business, as a railway contractor. Although the nephew and successor of one of the largest builders in England, he was taken from school at early age and regularly apprenticed as a working builder. He was barely a journeyman when he became the head of the firm, which, in addition to the ordinary routine of the building trade, undertook large contracts, such, for example, as the Hungerford Market—now the site of the West End Terminus of the South Eastern Company—and the Houses of Parliament, besides such various structures as clubs, theatres, prisons, castles and docks. But, in 1834, Mr. Peto gave up his purely building trade and determined—ultimately, as it proved, unfortunately for himself—to risk all in the new calling of railway contractor. His first work was the Wharncliff Viaduct, and he early became distinguished, like Mr. Brassey—afterwards, for some time, his partner—by the courage with which he undertook pecuniary responsibilities from which new companies shrank. Mr. Peto soon became honorably known to the public by the kind and assiduous care which he took of the welfare of his huge gangs of laborers. He rendered great assistance to the Government in 1854 by going out to the Crimea to superintend the construction of the Balaclava Railway, for which service, having declined any remuneration, he was created a baronet. Some years ago Sir Morton Peto became involved in the affairs of the London, Chatham & Dover Railway Company, and other unfortunate speculations, and, being unable to meet his engagements, his career as a great railway contractor was brought to an unhappy termination.

The late Mr. William Dargan was a very eminent contractor, and many of the principal Irish railways were either wholly or in part constructed by him. He was a man of great public spirit, and, in 1852, constructed at his own expense the building for the National Exhibition in Dublin, which took place in the following years. When the Queen went that year to Ireland he was the only private person to whom Her Majesty paid a visit, on which occasion she offered him a baronetcy, which he respectfully declined. Mr. Dargan died in 1868.

Brakes and Signals on British Railroads.

In an article on the recent severe accident of the Caledonian Railway at Kirtlebridge, the *Railway Service Gazette* (organ of a society of British railroad employees) says:

There are several points in connection with the terrible catastrophe at Kirtlebridge of the greatest interest to railway men, and upon these we will, therefore, make a few remarks. First, the present means of bringing fast trains to a standstill seem very inadequate. The companies have, lately, by their great concession to third-class passengers, materially augmented the weight of the trains, but no corresponding increase has been made in the brake-power. As a rule, there are only brakes on the wheels of two of the vehicles in a passenger train, the engine-tender and the guards' van (except on some of the Metropolitan lines, where every carriage is provided with brakes). It is, therefore, impossible to stop an express train going at a speed of forty-five or fifty miles an hour, without running a considerable distance, so that if, in the case of this accident at Kirtlebridge, the driver sees danger but a short distance ahead, he can do little or nothing toward reducing the speed of his train before it smashes into the obstruction. We are aware that in some cases, and no doubt this was one, it would be impossible to avoid a collision with the most perfect system of brakes; but the speed might be slackened sufficiently to very materially diminish the force of the shock, and, most likely, prevent loss of life. This subject directly concerns the railway men (since the driver of one of the engines was killed in the late collision), as well as the companies, and it would, perhaps, be as well if the Amalgamated Society appointed some one to make inquiries and report upon the subject of an improved brake system, with a view of recommending the adoption of the same to the various boards of directors, alleging as a reason for this course their desire to increase, as much as possible, the security of the members in the performance of their dangerous duties. We have received several communications relating to this question, and, as will be seen from the report of a meeting held some days ago at Crewe, the engine-drivers on the London & Northwestern line are already moving in the matter.

The next important consideration is the system, unfortunately much in use, of having the points and signals worked independently of each other. A very admirable plan of working them both together has lately been invented, called the "interlocking" system. This arrangement alone would have averted the accident, for when the station-master turned the points to allow the goods train to shunt on to the down line, the act of moving the lever would have caused the back signal to signify "danger," and this, of course, would have stopped the approaching train. Captain Tyler states, in another part of his report, that out of 159 accidents in 1871, 53, and in 1870, 60 out of 122 were caused either by the absence of this interlocking plan, or other defective mechanical arrangements; and he, very properly, makes some extremely severe remarks on the unwillingness exhibited by the companies in regard to the adoption of improvements, the merits of which have been well tried by experience. It is certain that accidents are frequently caused by the parsimony of the directors. We have here a specific case where, for the want of spending a few pounds on an alteration in the mode of working the points and signals, a great railway company has incurred a direct loss to the extent, no doubt, of tens of thousands of pounds (as compensation to the wounded and to the relatives of the killed), and an indirect loss (on account of the number of people it will deter from traveling over the Caledonian Railway for a considerable period), the extent of which it is impossible to estimate.

General Railroad News.

CHICAGO RAILROAD NEWS.

Chicago & Northwestern.

Eight construction trains and a large force of men are at work ballasting and completing the extension from Menomonee to Escanaba. Regular trains run as far as Marinette, and passengers are carried through to Escanaba by the construction trains. By January 1, it is thought the contractors will complete their work and the regular passenger and freight trains will run to Escanaba.

Milwaukee & St. Paul.

This company has nearly completed a freight house 70 by 420 feet, of Milwaukee brick, with white stone trimmings, extending from Halsted to Union street, between Union and Carroll, close to the Pittsburgh, Cincinnati & St. Louis Railway freight house. The roof is a combination truss, slated. The twelve doors on each side are cased with iron and slide up to open, being hung by wire ropes over pulleys, like windows. Another similar building is to be put up on the east side of Union street next year for an out-freight house.

Chicago, Danville & Vincennes.

The company's round-house in Danville is now very nearly completed. It is of brick, on a radius of 130 feet, and has stalls for 12 locomotives. A house almost exactly similar is nearly completed in the southwestern part of Chicago, at the corner of Douglas place and Western avenue (about five miles southwest of the Court House). There are in Danville, also, a machine shop 140 by 73 feet, ready for the machinery, and an engine of 100 horse-power has been purchased and will be put up directly; and a car shop 140 by 75 feet, and two stories high, which is almost completed. The company now has 25 locomotives.

ELECTIONS AND APPOINTMENTS.

—Mr. J. C. Buxton, in addition to his duties as General Freight Agent, has been appointed Superintendent of the Cincinnati, Sandusky & Cleveland Railroad. The President, Mr. Rush R. Sloan, has heretofore acted as Superintendent.

—It is reported that Mr. H. J. Hayden has been appointed General Freight Agent of the Boston & Albany Railroad, and will enter upon the duties of that position January 1. Mr. Hayden is now General Freight Agent of the Missouri River, Fort Scott & Gulf Railroad.

—Mr. W. P. Van Deusen has been appointed Auditor of the International and the Houston & Great Northern Railroad Companies.

—J. H. Smith has been appointed General Agent of the Great Jackson Route for the State of Texas, with headquarters at Houston, Texas.

—At the annual meeting of the stockholders of the Port Huron & Lake Michigan Railroad Company, recently, the following directors were elected: W. L. Bancroft, Edgar White, of Port Huron; Artemus Thayer, of Flint; Isaac Gale, Corunna; W. K. Muir, Joseph Price, Hamilton, Ont.; Townsend Cox, New York. Subsequently, W. L. Bancroft was elected President; Townsend Cox, Vice-President; Edgar White, Treasurer, and E. B. Taylor Secretary. Townsend Cox takes the place of W. T. Drake as Vice-President and in the board. All the other officers and directors are re-elected. Mr. Cox is President of the Canada, Michigan & Chicago Company.

—At the annual meeting of the stockholders of the Dakota Southern Railroad Company, at Yankton, Dak. Ter., Dec. 12, the following board of directors was chosen: C. G. Wicker, J. S. Meckling, J. O. Ratter, M. L. Scudder, Chicago; John A. Burbank, W. W. Brookings and George B. Hoffman, Yankton. G. G. Wicker was elected President; W. W. Brookings, Vice-President; J. R. Harson, Secretary and Treasurer. Messrs. Wicker, Scudder and Brookings were chosen an Executive Board. Messrs. Scudder and Brookings are the only members of the old board re-elected. Mr. Wicker takes the place of Mr. Brookings as President, the latter being made Vice-President. Mr. Harson is made Treasurer as well as Secretary, which latter office he held last year.

—John Whittle, of Cayuga, N. Y., has been appointed General Freight Agent of the Cayuga Lake Railroad.

—Horace S. Smith has been appointed Master Mechanic in charge of the shops of the St. Louis, Kansas City & Northern Railroad at Moberly, Mo. Mr. Smith has been foreman in the machine shops of the Chicago & Alton road at Bloomington, Ill.

TRAFFIC AND EARNINGS.

—The coal traffic of the Philadelphia & Reading Railroad for the year ending November 30, 1872, was: Anthracite, 5,457,880 tons; bituminous, 439,589 tons; total, 5,897,469 tons, paying freight. In addition to this 287,964 tons were shipped for the company's use, making the total coal shipments for the year 6,185,433 tons—about two thousand car-loads daily.

—The coal tonnage of the Schuylkill Canal for the year ending November 30, 1872, was 838,190 tons.

—The earnings of the St. Louis & Southeastern Railway (consolidated) for the first week in December were $18,550.83. The horse disease interfered very much with the business of the road during the week.

—At this time the Mississippi barge lines make such charges for carrying grain from Cairo to New Orleans that shipments are trifling. It is reported that a Liverpool steamer will sell her space for bulk grain at 12 pence a bushel for the year. It is said that if the barges will carry from Cairo during December and January for 18 cents and from St. Louis during the rest of the year at 10 cents a bushel, a good deal of grain would be shipped.

—The shipments of coal from Cumberland, Md., by the Chesapeake & Ohio Canal, during the season of 1872, were 814,365 tons. Of this 786,951 tons went to Georgetown or Alexandria, the remainder going to way points.

—For the year ending November 30, the total shipments of anthracite coal over the Lehigh Valley Railroad were 3,850,118 tons, against 2 210,272 tons the preceding year, showing an increase of 1,639,846 tons, or 74¼ per cent. Of this amount, 350,669 tons were delivered to the Pennsylvania and New York road, 229,374 to the Canal at Penn Haven, and 123,191 tons at Mauch Chunk, 9,668 tons to the Catawissa Railroad, 123,509 tons were consumed by the road or delivered at points on the line, and the balance, or 3,013,707 tons, was shipped east by rail.

—The coal shipments over the Pennsylvania & New York Railroad for the year ending November 30, 1872, were: anthracite, 580,937 tons; bituminous, 337,937 tons; total, 918,128 tons.

—The receipts of the St. Louis & Iron Mountain Railroad for the first week of December were: 1872, $46,960.25; 1871, $41,457.84; increase, $5,502.41, or 13¼ per cent.

—The earnings of the Erie Railway for the week ending December 15, were: 1872, $378,353; 1871, $328,090; increase $50,263, or 15½ per cent.

—Mr. T. H. Perry has been appointed Chief Engineer of the Pekin & Mississippi Railroad. Mr. Perry has held a similar position on the Kankakee & Indiana Railroad.

—The following are reports of earnings, for October, of Canadian railroads:

	Total 1872.	Total 1871.	Miles.
Great Western	$522 387	$433,519	351½
Grand Trunk	811,865	766 821	1,377
Welland	11,147	10,644	25
Midland of Canada	37,542	26,385	89
Brockville & Ottawa	26 538	.....	86
Canada Central	7,109	.....	26
St Lawrence & Ottawa	16,0 7	12,633	54
St. Lawrence & Industry	1 395	1,356	..
European & North American	33,864	27,862	108
Nova Scotia	*40,305	31,854	145
Total	$1,518,085	$1,310,093	2,963½

* Including W. Branch, $11,186.31.

These earnings are at the average rate of $670 per mile of road, the Great Western leading with $1,486, and the Grand Trunk is below the average, with $590 per mile.

—The Marquette *Mining Journal* gives the reports of the iron and iron ore shipments for the past season, by which it appears that the shipments from Marquette (arriving by the Marquette, Houghton & Ontonagon Railroad) were 408,191 tons of ore and 28,906 tons of pig, against 367,078 tons of ore and and 26,966 of pig in the season of 1871; the shipments from Escanaba (arriving by the Peninsula Division of the Chicago & Northwestern) were 488,686 tons of ore and 9,166 of pig in 1872.

PERSONAL.

—We have learned only within a few days of the death, on the 21st of November, of Mr. Gorge Coffing, the President of the Ramapo Wheel and Foundry Company, of Ramapo, New York. He was largely interested in iron manufactures, and was Treasurer of the Richmond Iron Works, the Lime Rock Iron Works and the Hunts Lyman Iron Company; President of the Ramapo Wheel and Foundry Company, of the Cayuta Wheel and Foundry Company, Waverly, N. Y., and the Washinee Company of Salisbury; a director of the Kent Iron Company, and of the Monument Mills of Housatonic, and was a third owner of the Lenox Iron Works. His death was very sudden, and caused by apoplexy. He was taken away in the prime of life and from the midst of a busy and useful business career. His loss will be lamented by a large circle of acquaintances outside of his own family and friends.

—The *Evening Republican*, of Meadville, Pa., has some highly complimentary notices of Mr. James B. Hodgskin, Treasurer of the Atlantic & Great Western Railroad Company, now having his headquarters in that city. Mr. Hodgskin has been showing such a liberality toward some of the local institutions of Meadville as has secured the good will of its citizens, and the commendation of its press.

OLD AND NEW ROADS.

Delaware, Lackawanna & Western.

The trouble between this company and the Central of New Jersey culminated December 14, in the refusal of the Central Company to receive any more coal from the other company at Hampton Junction. A large part of the coal business has always gone over the Central road, a third rail having been laid for that purpose on the Central from Hampton Junction to Elizabethport. The Delaware, Lackawanna & Western would, doubtless, have been able to forward all its coal over the Morris & Essex Division, although the dock facilities at Hoboken would probably have been insufficient, and the large dock property owned by the company at Elizabethport have been useless for a time. The question, however, is settled by an injunction of the courts, which decided that the New Jersey Central Company has not the right to refuse to carry the coal.

Marquette, Houghton & Ontonagon.

A telegram from Escanaba announces that the track is completed to L'Anse, on Keweenaw Bay, and trains will shortly commence running.

Houston & Great Northern.

Texas papers of recent date report that the track-layers have reached a point within eight miles of Palestine, Tex., the crossing of the International road. This is 24 miles beyond Crockett the late terminus, and 139 miles from Houston.

Lake Shore & Tuscarawas Valley.

The track is laid to New Philadelphia, O., ten miles beyond Strasburg, the late terminus, and cars are running to that point.

Southern Pennsylvania.

It is reported that this road is to be sold in Philadelphia December 21. The road extends from Marion, Pa., on the Cumberland Valley road to Mercersburg, 14 miles, with a branch from Bridgeport to Cowans Gap, 13 miles. It was intended originally to extend west to Bedford, some 60 miles.

Toledo & Southwestern.

The surveys for this road have been completed from Grand Rapids, Ohio, southwest to Muncie, Ind., about 140 miles.

Mansfield, Cold Water & Lake Michigan.

This road, it is said, will be ironed this winter from Tiffin, O., to Fostoria, where connection will be made with the Lake Erie & Louisville road. No iron will be laid beyond Fostoria until the arrearages of subscriptions have been paid up.

Sioux City Bridge.

A company has been organized to build a bridge over the Missouri River at Sioux City, Iowa. The estimated cost of the bridge is $1,500,000.

Independence, Colorado, Arizona & Pacific.

This is the name of a company which is making surveys for a railroad from Independence, Kan., west about 100 miles to Oxford, in Sumner County. Independence is the terminus of a branch of the Leavenworth, Lawrence & Galveston road.

Atlantic & Lake Erie.

At a meeting of the stockholders, held in Columbus, O., December 17, it was voted to ratify the agreement with the Columbus & Ferrara Company as to the construction and use in common of the section of road between Pleasantville, O., and Ferrara. The stockholders voted to sustain the directors in refusing to sell or lease that portion of the road between Toledo and Fostoria.

Walla Walla & Columbia River.

The ties and other timber necessary for the road have all been gotten out, and the track will be laid early in the spring.

Canada Southern.

The last rail between St. Thomas and Amherstburg was laid December 12, and a train passed over the track between those places the next day.

Great Western Construction Company.

This company, whose headquarters will be in Chicago, has filed its certificate of incorporation with the Secretary of State at Springfield, Ill. The capital stock of the company will be $800,000.

Virginia & Truckee.

The American Flat Tunnel on this road, which was destroyed by fire a few weeks since, has been entirely repaired and the road is now in full running order.

Winona & St. Peter.

The engineers of this company have completed the preliminary surveys for a branch from Sleepy Eye Lake, Minn., north to Red Wood Falls, about 20 miles.

Catawissa.

It is reported that an extension will shortly be commenced from Williamsport, Pa., the present terminus of the road, to Emporium, where connection will be made with the Buffalo, New York & Philadelphia. The distance between these points by the Philadelphia & Erie, to which the new road would probably be parallel, is 99 miles.

Chesapeake & Ohio.

The latest advices were that only twenty miles of track remained to be laid to complete this road, the extensions being made from both ends. This gave the company 408 miles of road, which is probably now considerably extended, as it was intended to have the line completed, or very nearly so, by the close of the year. About 100 miles of track has been laid this year, and the work has been through a very difficult country, involving heavy rock cuttings and several tunnels.

Columbus & Toledo.

The directors of this company met at Columbus, O., December 3d, and decided finally to locate the line on what is known as the eastern line, by way of Delaware, Marion, Upper Sandusky, Carey and Fostoria. This line is about 120 miles long. The advocates of this route claimed to have secured subscriptions to the amount of $517,000 besides a large part of the right of way. The advocates of the western line, through Marysville, Kenton and Findlay, purpose to organize a new company and build another and competing line from Toledo to Columbus.

Milwaukee & St. Paul.

The line between Winona and La Crescent, Minn., about 30 miles long, completing a connection between this company's line from Chicago and Milwaukee to La Crosse, and that from Winona to St. Paul, was completed by the laying of the last rail at La Crescent on the 17th inst. This gives the company a line from Milwaukee to St. Paul only 328 miles long, which will probably be reduced by three or four miles by crossing trains on a bridge above La Crosse. The old route by way of Prairie du Chien is 406 miles long. The new route will be about 414 miles long from Chicago to St. Paul.

New York Elevated Railroad.

This road has proved so far successful that the managers feel justified in making extensive improvements. New turn-outs have been built at Canal and Christopher streets, to enable the trains to pass each other. An additional train has been already put on the track, and another will be ready in a few days. The new cars are similar to those now in use, but are a little larger, carrying six more passengers each. The trains will be run at intervals of twelve or fifteen minutes. The company has leased property on Broadway between Battery place and Morris street, and will erect upon it, besides waiting rooms and ticket offices, a train house with four tracks, and a small repair shop.

Lake Shore & Michigan Southern

This company has purchased the sand ridge connecting Catawba Island and the Peninsula, three miles east of Port Clinton, O., and has laid a track to the ridge. At this point there is a large deposit of gravel, of good quality for ballasting. A steam shovel is to be used to load the cars.

Orange, Alexandria & Manassas.

At the recent annual meeting of this company the committee appointed to examine the road reported that several new bridges had been constructed, a large number of new ties put in and about four miles of new iron laid. The committee recommended that several of the depots on the line be enlarged or rebuilt. The committee also strongly recommend that a new road be built from Charlottesville to Gordonsville, between which points the track of the Chesapeake & Ohio road is now used. The distance between these points is 22 miles.

Pittsburgh, Washington & Baltimore.

At the annual meeting held in Pittsburgh recently it was stated that the earnings for the year ending October 31 were $1,478,629. The earnings the previous year were $964,989, showing an increase last year of $513,640, or 53½ per cent. New iron has been laid from Pittsburgh to Connellsville, 57 miles, five miles of grading for the double track completed and nearly 14 miles of new sidings laid. The company now has 60 locomotives in use, and contracts are out for more.

New York & Queens County Bridge Company.

The directors of this company, which purposes to build a bridge across the East River and Blackwell's Island from New York to Astoria, met in New York, November 20, and organized by the election of the following officers: George F. Carman, President; L. Bradford Prince, Vice-President; Benjamin W. Hitchcock, Secretary, and Blaize L. Harsell, Treasurer. An Executive Committee was appointed, consisting of Hon. L. B. Prince, Chairman: Aaron A. Degrauw, R. M. C. Graham, B. L. Harsell and B. W. Hitchcock. It was resolved to make no commencement of work until one-half the capital has been subscribed. The capital is to be $2,000,000 with power to increase to $4,000,000. The shares are $20 each. The company was chartered by the last Legislature of New York.

Texas & Pacific.

The work on the trestle-work through the Trinity bottom, and the bridge over the Trinity River, near Dallas, Texas, is progressing well, nearly all the piles for the bridge piers and the trestle-work foundation being down.

The surveying parties on the California end of the line have reached the Desert in Southeast California, and are engaged in running several lines across the Desert to the Colorado River. The line surveyed runs northeast from San Diego by way of San Luis Key and Temecula to the San Gorgonio Pass, and thence eastward down the Cahuilla Valley to the Desert.

By the arrangements recently made by the city of San Diego, all the property of the San Diego & Gila Railroad Company passes to the Texas & Pacific. This property includes 6,000 acres of land in San Diego, including 800 acres with water front. The franchises of the San Diego & Gila Company are included, and also the right of way for a considerable distance. All this property is transferred free from all the claims of the old Memphis, El Paso & Pacific Company, which claims were settled by the San Diego Committee.

Cumberland Valley.

The annual report of this company shows that the receipts for the year ending September 30 were: From passengers, $189,-332.99; freight, $374,593.18; mails, express, etc., $16,838.40; total, $581,061.57. The balance on hand at the commencement of the year was $94,798.11, and $167,600 was received from the issue of new capital stock, making the whole receipts $843,462.-68. The operating expenses were $293,074.61, or 50½ per cent. of the gross receipts from the road. There was paid for dividends, $106,567.67; interest on bonds, $25,369.39; to trustees of the sinking fund, $115,199.17. The sum of $165,513.12 was paid for new construction and material therefor, and a cash balance of $137,738.78 remained on hand. The first preferred stock now amounts to $241,900; second preferred stock, $243,000; common stock, $1,009,350. The first-mortgage bonds are $161,-000; second mortgage, $109,500; common bonds, $81,800; making the whole capital account $1,846,550. The first and second-mortgage bonds bear 8 per cent., the other bonds 6 per cent. interest. The capital account is at the rate of $22,350 per mile.

During the year the second track has been completed from Bridgeport to Mechanicsburg, 9 miles; and the business of the road is increasing so rapidly that it is believed that it will be necessary to extend the second track to Carlisle, 9 miles further. Several new branch roads have been or will shortly be completed which will bring a considerable addition of business to the road. The South Mountain Iron Company's road is completed from Carlisle to Pine Grove, and the Mount Alto Railroad from Chambersburg to Mount Alto. The Dillsburg & Mechanicsburg road is making good progress. The Southern Pennsylvania road is still unfinished, but the road is shortly to be sold, and it is probable that arrangements will be made for its speedy completion. The 20 miles completed is operated by the Cumberland Valley Company under a lease.

The extension of the Cumberland Valley road from Hagerstown to the Potomac and the bridge over that river are now completed. No great increase of business is looked for from the extension until the completion of the Martinsburg & Potomac road, which will connect the Cumberland Valley with the Baltimore & Ohio road at Martinsburg. This road will be completed next season.

The length of the road from Harrisburg to the Potomac at Powell's Bend is 81 miles; and the South Mountain road, 18 miles, the Southern Pennsylvania, 20 miles, and the Mount Alto, 13 miles, are operated under lease, making in all 132 miles of road in use.

Chesapeake & Ohio Canal.

At a meeting of the directors at Baltimore, December 12, the report of the President was presented. The receipts for the month of November were $35,725.53, being a decrease of $11,-770.98 as compared with November of last year. The falling off was mainly due to the presence of disease among the horses employed on the canal, which prevented many of the boats from making their trips. The whole amount of coal shipped from Cumberland during the season of navigation was 563,102 tons, an increase of 5,587 tons over last year. The surplus on hand is now $133,791.39. The board appropriated $50,985 to pay the coupon due July, 1856, on the construction bonds, leaving a surplus on hand of $82,806.39, which it is estimated will be enough to pay for all the necessary repairs and new construction on the canal this winter.

Erie.

The Secretary of the Treasury has decided that in transporting imported goods, duty unpaid, to interior ports of entry, this company has erred in using what is known as the "D" lock, and should use the "XX" lock of the American Seal Lock Company, and glass seals; and it is ordered that the latter be used hereafter and a photograph of the seals used be placed in each copy of the special manifest. Such shipments by this road must be confined to the ports of Buffalo, Cleveland, Cincinnati, Detroit, Chicago, Milwaukee and San Francisco. When necessary to transship unappraised goods, the intention should be set forth in the manifest.

Cincinnati, Lafayette & Chicago.

The Indiana Company of this name has consolidated with the organization of the same name in Illinois, under the general railroad law of that State.

Pacific of Missouri.

This company has completed its tracks down to the levee in St. Louis, and is now prepared to receive and deliver freight at the steamboat landing between Olive and Locust streets. This will save a great amount of draying, which has always been one of the great obstacles to traffic in St. Louis.

St. Louis Stock Yards.

The stock is all taken in a company which purposes to construct stock yards in St. Louis, near the junction of the tracks of the Pacific Railroad and the St. Louis, Kansas City & Northern. The great yards in which most of the railroad companies are interested are in East St. Louis.

Erie.

One of the preferred stockholders sued the company for dividends, claiming that this stock is entitled to dividends before interest is paid on the £1,000,000 of sterling bonds issued in 1865, and before rent is paid on any leases taken since 1862. Judge Blatchford, in New York, decides that the preferred has no priority except over common stock.

St. Louis & Southeastern.

This company is offering in the New York market its first-mortgage 7 per cent. gold bonds, having 30 years to run, at the rate of $21,000 per mile on the entire consolidated road, the price at present being 90. This will be the sole mortgage upon the road, as this amount is to cover the bonds issued before the consolidation and those of the late Evansville, Henderson & Nashville Company. The gross earnings since consolidation have been at the rate of $105,000 per month, and are increasing and pretty sure to increase largely. The amount absorbed by the interest of the bonds would be nearly $50,000 per month.

Croton River Extension.

This company has filed its articles of association with the Secretary of State of New York. The road will extend from Port Morris on Long Island Sound about three miles to a point in Morrisania, where connection will be made with the proposed New York and Croton Railroad. The capital stock is to be $500,000.

Alabama & Chattanooga.

The Superior Court of Dade County, Ga., has dismissed the bill filed against this road by the State of Alabama, on the ground that the road had been sold in bankruptcy and the State had become the purchaser. This decision affirms the legality of the bankruptcy proceedings under which the road was sold. An appeal will be taken to the Supreme Court of Georgia.

North & South, of Georgia.

The Governor of Georgia has appointed a commission to examine the first section of 20 miles of this road, extending from Columbus, Ga., toward Hamilton, to ascertain whether the company has complied with the law so as to entitle it to the State aid.

New York & New Jersey.

This company has filed articles of association in the office of the Secretary of State of New York. The road is to extend from Middletown, in Orange County, to Greenwood Lake, a distance of about 30 miles. At Greenwood Lake connection will be made with the Montclair Division of the Midland.

Schenectady & Ogdensburg.

This company has filed a certificate in the office of the Secretary of State of New York to the effect that the company has adopted the route surveyed under the direction of the State Engineer, in pursuance of an act passed May 26, 1866.

Burlington, Cedar Rapids & Minnesota.

The time table dated December 22 shows trains running on the branch, or extension west from Vinton, Ia., to Dysart, 16 miles from Vinton. There is one intervening station, Benton, seven miles from Vinton. This branch is called by the company the "Pacific Division."

Toledo, Tiffin & Eastern.

This road is completed to Mansfield, O., and the first train passed over it December 18. The work of ballasting is proceeding rapidly, and it is expected that regular trains will be put on from Toledo to Mansfield early in January.

New York & Oswego Midland.

The track of the Norwich & Auburn Division is completed as far as Scipio Center, N. Y., 96 miles from Cortland, and the road has been formally opened to that point. This is 16 miles more of track on this division than has hitherto been reported.

Evansville, Terre Haute & Chicago.

The machine shops of this company at Terre Haute, Ind., were destroyed by fire on the evening of December 19. The loss is stated to be about $20,000.

Galena & Southern Wisconsin.

The grading of this narrow-gauge road is completed from Galena, Ill., to the Wisconsin State line, about 10 miles, and the bridges are all ready for the iron.

St. Paul & Iowa Southwestern.

The contract for building this road from Mason City, Iowa, southwest through Webster City, Boone and Dallas Center to Dexter, in Dallas County, a distance of about 130 miles, has been let to a Detroit company, which is said to represent some German capitalists. The road is to be completed by January 1, 1874.

New York Central & Hudson River.

The new freight track will pass entirely around Syracuse, instead of through that city. The line surveyed leaves the present line near the yard east of the city and passes through Salina, rejoining the main track near the crossing of the Oswego & Syracuse road.

Iowa Railroad Land Company.

The sales of this company for November were 9,827.06 acres to 92 purchasers, for $66,513.88. The sales of the company for eight months, ending November 30, have been 112,649.39 acres to 1,233 purchasers, for $816,241.42, averaging 90½ acres to each settler. These lands are of the government grants to the railroad lines operated by the Chicago & Northwestern, Illinois Central, and Sioux City & Pacific railroads, and are located in middle and western Iowa.

Cleveland, Akron & Canton.

A company has been organized to build a railroad from Cleveland, Ohio, south through Cuyahoga Falls, Bedford and Newburg to Akron, and thence to Canton. The distance from Cleveland to Akron by this route is 34 miles, and to Canton 56 miles. It is proposed to use the Cleveland & Mahoning track for eight miles from Cleveland. This road would connect at Akron with the Atlantic & Great Western and at Canton with the Pittsburgh, Fort Wayne & Chicago, and it would be parallel and close to the projected Cuyahoga Valley road. At a meet-

ing held at Akron recently, Mr. Hodgskin, Treasurer of the Atlantic & Great Western, stated that the company was willing to give all the assistance in its power to the people along the line in building the road. The capital of the company is to be $300,000, and the incorporators are: S. Burke, J. Tod, R. Hitchcock and A. K. Spencer, of Cleveland; Lewis Miller, of Akron, and W. A. Hanford, of Cuyahoga Falls. The road is to be of 4ft. 8½in. gauge.

Northern Pacific.

General Cass, in accepting the presidency, made some remarks before the board of directors which have been published. He had recently passed over about 1,000 miles of the road, more than one-half being on the Pacific coast. He expressed himself satisfied that the road can be constructed at a reasonable cost, operated and maintained at a less cost than any other line north of the thirty-third parallel, and will have a larger traffic than any other road west of the hundredth meridian can have.

Petersburg.

A bill has been introduced into the Virginia Legislature authorizing this company to extend its line from Petersburg, Va., to Washington, D. C.; and to increase its capital stock to $10,000,000. The road now extends from Petersburgh south to Weldon, N. C.

New York, West Shore & Chicago.

A corps of engineers of this company are now engaged in making the location of the proposed Albany Branch of the road. This branch line is to leave the main line near Jayne's Corners, about 22 miles above Catskill—where the main line leaves the Hudson River—and run northeasterly to a point about five miles south of Albany, thence descending with a uniform grade of 30.6 feet per mile along the river bank to the south end of Van Rensselaer Island, crossing which it enters the city at the south end of Broadway.

The line is about nine miles long, and the distance *via* this branch to New York is said to be less than *via* the Hudson River Railroad.

Dividends.

The Atlantic & Pacific will pay the guaranteed dividend on the stock of the Pacific at its New York and St. Louis offices, January 15. Transfer books close on the 6th and will be re-opened on the 20th.

Wells, Fargo & Co.'s Express pays 4 per cent., January 6.

The Connecticut River Railroad pays 5 per cent., January 2.

On the same date the Panama pays 3 per cent. (quarterly dividend), the New York, New Haven & Hartford 5 per cent., the New York & Harlem 4 per cent. (on common and preferred), the Fitchburg Railroad 4 per cent., the Boston & Lowell 4 per cent., the Albany & Susquehanna 3½ per cent., the Rensselaer & Saratoga 4 per cent.

The Central Ohio pays 3 per cent. December 30; the Philadelphia & Trenton 2½ per cent., January 10; the Philadelphia, Wilmington & Baltimore 4 per cent., January 8; the Rome, Watertown & Ogdensburg 5 per cent., February 15.

Shenandoah Valley.

The Commissioners of Finance of the city of Baltimore have presented a report to the Common Council, giving the reasons why they have refused to pay to the Valley Railroad Company any portion of the amount subscribed by the city of Baltimore. In the ordinance under which the subscription was made, it was provided that no portion of the money should be paid until the Commissioners were satisfied that the company had secured sufficient means to build the whole road. The first estimate for the cost of the road was $3,960,000, to provide for which the company had the subscriptions of Baltimore, $1,000,000, of the Baltimore & Ohio Railroad Company, $1,000,000, and of towns and individuals in Virginia $1,200,000, in all $3,200,000, leaving only $760,000 to be raised by the sale of bonds of the company. Subsequently, however, an amended estimate was filed, showing the amount required to build the road to be $5,750,000, leaving the sum of $2,250,000 not provided for by subscriptions. The company claim that this amount can readily be raised by the sale of bonds, but the Commissioners, fortified by legal opinions, decline to pay over any of the city's money until some further arrangements are made. The company has made a formal demand for the payment of 30 per cent. of the subscription.

Southbridge & Palmer.

The town of Southbridge, Mass., has voted against taking stock in this company. This, it is thought, will delay or prevent altogether the construction of the road.

Connecticut Western.

The town of Suffield, Conn., has voted to extend the time for the completion of the branch from Tariffville to Springfield, Mass., in aid of which the town some time ago voted $60,000.

Bangor & Calais Shore Line.

A meeting of citizens was held at Bangor, Me., Dec. 14, on the question of taking stock in this proposed narrow-gauge road. The Boston *Advertiser*, in its report of the meeting, says: "The general tone of the speeches were adverse to the scheme, several speakers denouncing it as a swindle, and advocating the building of a broad-gauge line, with a light rail and equipments."

Mansfield & North Bridgewater.

A railroad is proposed from Mansfield, Mass., east to North Bridgewater, about 12 miles. An effort is being made to have the Boston, Clinton & Fitchburg Company build and operate the road as a branch of its Mansfield & Framingham line. The construction of the road would give the Bridgewater people a direct line to Providence, R. I.

Harlem River & Port Chester.

The junction of this road with the New York & New Haven, at New Rochelle, N. Y., is completed. The work is being rapidly pushed, and the road will probably be completed by spring.

Boston, Hoosac Tunnel & Albany.

The company which is to build this projected road from North Adams, Mass., to Albany, N. Y., has been organized, and work will be commenced in the spring.

Baltimore & Towsontown Narrow Gauge.

The contract for the construction of this road has been let, and work will begin in ten days. The contract price is $90,000, and the road is to be completed by July 1, 1873.

New York, New Haven & Hartford.

This company has commenced the trial of a new system for paying their dividends, which, it is thought, will save the stockholders some trouble and expense. The stockholder receives a printed form, stating the amount of dividends due him, enclosed with a blank order, which the holder signs and returns to the Treasurer of the company, who sends him a check for the amount due.

Old Colony.

This company has commenced the construction of an extension of the Granite Branch, from West Quincy to Braintree, about four miles. This will give the company a loop line, or third track from Atlantic Station to Braintree, about six miles.

Galion, Logansport & Chicago.

A company has been organized under this name to build a railroad from Galion, O., west to the State line in Mercer County, a distance of about 110 miles. The capital stock is to be $2,500,000. Ten per cent. of this stock has been subscribed, as required by law, and the company organized by the selection of the following officers: President, J. Marshman; Vice-President, J. Riblet; Secretary, J. H. Green; Treasurer, S. K. Mann; Directors, F. C. LeBlond, W. C. Cesna, General George B. Wright, W. Armstrong, J. Marshman and J. Riblet. The correspondent of the Cleveland (O.) *Herald* gives the following list of subscribers to the stock:

F. C. LeBlond, of Celina, 2 shares		$100
W. C. Cesna, Kenton, 1 share		50
W. Armstrong, Galion, 1 share		50
Jacob Riblet	"	218,500
J. Marshman,	" 10 shares	500
S. K. Mann,	" 5 shares	250
J. H. Green,	" 10 shares	501
Gen. George B. Wright, Meadville, 1 share		50

"The share of General Wright was subscribed for him by some friend for the purpose of making him a director, to give character to the enterprise."

An effort is being made to have that portion of the road nearest to Galion built by the towns through which it will pass, under the Boesel law.

International & Great Northern.

The two roads are divided for operation into three divisions, the "Houston Division" including the line from Houston to Palestine, the "Brazos Division" the part of the International west of Palestine, and the "Red River Division" the part of the International east of Palestine.

Iowa Central.

This company has failed to build the line from Wells to Mankato, Minn., and also that from Northwood, Iowa, to Albert Lea, Minn, this season, as agreed. Minnesota papers allege that the failure to fulfill these agreements has been caused by lack of funds.

Cairo & Fulton.

A correspondent informs us that the grading south of Little Rock is progressing well, in spite of the delays caused by the epizootic. A force of about 1,200 men is at work on that portion of the line, and the contractors, Messrs. Mandeville & Allen, expect to have all the grading completed by May, 1, 1873.

Painesville & Youngstown.

A telegram from Youngstown says that P. T. Cook, a contractor on this railroad, absconded on the 17th with about $12,000 belonging to the company which he had drawn to pay the laborers in his employ, about 400 in number. Six weeks' wages were due them. Cook is supposed to have fled to Canada. His flight causes the suspension of the work for the time.

Lake Shore & Tuscarawas Valley.

This road is now completed to Urichsville, O., 12 miles beyond New Philadelphia, the last point reported. At Urichsville, which is 93 miles west of Pittsburgh, connection is made with the Pittsburgh, Cincinnati & St. Louis Railway. The road, which is about 100 miles long, extends from Black River, O., on Lake Erie, about 30 miles west of Cleveland, southwest through Elyria, Grafton, York, Medina, Clinton, Fulton, Massillon, Strasburgh, Dover and New Philadelphia to Urichsville. It crosses the Lake Shore road at Elyria, the Cleveland, Columbus, Cincinnati & Indianapolis at Grafton, the Atlantic & Great Western at Milton, the Pittsburgh, Fort Wayne & Chicago at Massillon, and the Tuscarawas Branch of the Cleveland & Pittsburgh at New Philadelphia. The road is expected to do a large coal business. Arrangements are being made for an extension of the road from Urichsville southwest to Wheeling, W. Va., a distance of about 50 miles.

Connecticut Air Line.

The first engine crossed the bridge over the Connecticut River at Middletown, Conn., December 17. The bridge has cost about $400,000.

Right to Stop Over.

In the decision of the Supreme Court of Pennsylvania at Pittsburgh, in the case of the Oil Creek & Allegheny River Railroad Company against Clark, is the following:

"A ticket such as that printed in our paper-books imports upon its face no right to stop off, or in other words, to make the journey, between the points named in it, by stages and by different trains. It is simply a ticket from the station called Miller Farm to Oil City, and imports nothing but a single and continuous trip. If a privilege of stopping off and continuing the trip at a subsequent time and by a different train exist, it is only the rule or sufferance of the carrier, who, having commenced the performance of his part of the contract of carrier, has a right to pursue it to completion. As the ticket imports a continuous passage, the company having undertaken and commenced its performance, it is evident that it lies on the passenger holding such a ticket to inquire whether a rule to suffer him to change the terms of his ticket exists, and what are the conditions of the exercise of the privilege. He must ask for his stop off, and exercise the privilege upon the conditions imposed; and this is usually by obtaining a stop-off check, to be presented to the conductor of the next train."

Canada Southern.

The transfer boat which is to be used to ferry cars across the Detroit River from Malden, Ont., to Trenton, Mich., is nearly ready to be launched. The boat, which is of wood, heavily sheated with iron as a protection against ice, is 244 feet long and 14 feet depth of hold and 75 feet wide over the guards. Three tracks, each long enough for seven cars, will be laid on the deck, giving the boat a carrying capacity of 21 cars each trip. She is a side-wheel boat, and will have two double-cylinder engines, with four boilers. The engines, it is thought, are of sufficient capacity to do any required work in forcing the boat through the ice.

Richmond & Trans-Allegheny.

This company asks a charter from the Virginia Legislature to build a railroad of three-feet gauge from Richmond west to the Kentucky line in Lee or Wise County. General John D. Imboden, Robert H. Maury, Franklin Stearns, and Charles S. Mills, of Richmond; Beverly A. Davis, of Pittsylvania; William M. Perkins, of Buckingham; George G. Saunders, of Bedford; James Calloway, of Franklin; Joseph Howard, of Floyd; Henry B. Harman, of Tazewell; Thomas A. M. Alderson and Dale Carter, of Russell; Samuel Graham, of Buchanan, and Dr. Hinden Riggs, of Wise Country, Virginia; Thomas Cumming Davis, Jules Ranscelot and Frank Drummond, of London, England, or any five of them, are asked to be a constituted body politic and corporate for the purposes of carrying into full effect the intent of the charter. The capital stock of the company is to be $6,000,000, with authority to increase it to $12,000,000.

Lake Shore & Tuscarawas Valley.

This road is now completed to Uhrichsville, O., 12 miles south of New Philadelphia, on the Pittsburgh, Cincinnati & St. Louis Railway, 93 miles west of Pittsburgh.

Washington & Weldon.

A bill has been introduced into the Virginia Legislature to incorporate a company by this name. The bill provides for the opening of books of subscription in Petersburg. The object is the establishment of a railroad between some point on the boundary line between Virginia and North Carolina, near Weldon, and some point on the Potomac, opposite or near Washington, D. C., the capital stock to be not less than one million nor more than ten millions of dollars, to be divided into shares of $100 each. The bill provides for the building or purchase of a road in whole or in part, and authorizes subscriptions by the cities of Petersburg, Richmond and Alexandria, the town of Fredericksburg, the Richmond & Petersburg Railroad Company, the Petersburg Railroad Company, the Clover Hill Railroad Company, the Richmond, Fredericksburg & Potomac Railroad Company, and the Alexandria & Fredericksburg Railroad Company.

Warren & Venango.

Trouble has arisen between this company and the Oil Creek & Allegheny River Company with regard to the crossing of the two roads at Titusville. This trouble will have to be settled by the courts, and will, probably, delay the opening of the Warren & Venango road for a week or two.

Bainbridge, Cuthbert & Columbus.

It is reported that this road, or what there is of it, will soon be sold, and that the North & South Alabama will be the purchaser. In this case the road will probably be completed.

Milwaukee Railroad Bonds.

In the case of James and others against the city of Milwaukee, the Supreme Court of the United States has just decided that the bonds issued by the city of Milwaukee to the Milwaukee & Superior and the Milwaukee & Beloit Railroad Companies are legal, and their payment can be enforced. The bonds in question were voted by the city in 1856, $100,000 to each company, and no interest has ever been paid on them. The present suit was brought to enforce the payment of interest, and the court below decided that the bonds were illegally issued, on the ground that the companies to which they were voted were not in existence when the act authorizing the city to aid in the construction of railroads was passed. This decision has now been reversed. The bonds and accrued interest now amount to about $400,000. The roads for the construction of which they were issued were never built, though we believe some little work was done on both of them.

International & Great Northern.

Under this name the International and Houston & Great Northern roads will be worked hereafter, under the management of H. M. Hoxie, General Superintendent of both roads. His circulars, dated the 12th, announce that the Houston & Great Northern is completed to the junction with the International at Palestine, eight miles further than we reported last, and 152 miles from Houston, and the International is extended northeastward from Troupe to Overton, 11 miles, making it 151 miles long. Only 22 miles remains to complete this road to a connection with the Texas & Pacific at Longview, 66 miles west of Shreveport.

Passenger trains now run from Houston to Overton, 213 miles, and also from Houston to Hearne. Including the branch of the Great Northern from Phelps to Huntsville, 8 miles, and the western extension of the International from Hearne to Brazos, 6 miles, this is a total of 317 miles of railroad under one management. It is already one of the chief outlets from the interior of Texas to the Gulf, and as soon as a connection is completed from Shreveport eastward or northeastward, it will be an equally good outlet to the East and the Upper Mississippi and lake cities.

Dakota Valley.

This company has been organized in Yankton, Dakota Territory, and proposes to build a railroad from that town up the valley of the Dakota (or James) River to intersect the Winona & St. Peter Railroad west of the Minnesota State line.

Cairo & Vincennes.

This railroad was opened for the passage of through trains on the 13th. The line extends nearly due southwest from Vincennes, Ind., the terminus of the Indianapolis & Vincennes Railroad, to Cairo, Ill., 157 miles, being largely over the hilly, rocky and wooded portions of Illinois, totally unlike the prairie country which forms the most of that State. An excursion train passed over the road on the 16th. Some work was done on the road a few years ago, but nearly the whole work has been accomplished by the contractors, Messrs. Winslow & Wilson, since the first of April last.

Syracuse Northern.

The track of this company was extended on Sunday, Dec. 14, from the late terminus through a portion of the city of Syracuse to the New York Central road. The completion of this connection will secure to the Syracuse Northern road a large increase of freight traffic.

Rochester & State Line.

Amended articles have been filed by this company with the Secretary of State of New York, to cover a slight change in the route of the road. The whole length of the road from Rochester to Salamanca will be 103 miles.

Cleveland, Mount Vernon & Delaware.

The necessary papers have been filed with the Secretary of State of Ohio, to enable the company to construct a branch from near Oxford in Holmes County, south through Coshocton and Muskingum counties to Dresden on the Pittsburgh, Cincinnati & St. Louis road, a distance of about 40 miles. The capital stock is to be increased $1,000,000, making it $3,000,000.

Delaware & Hudson Canal Company.

The management of the Rensselaer & Saratoga and the Albany & Susquehanna roads (both leased by this company), is to be consolidated and the general offices for both roads will be located in Albany.

Brunswick & Albany.

At a public meeting held recently in Brunswick, Ga., a representative of the foreign bondholders was present and stated that the bondholders were prepared to pay all the just indebtedness of the road and complete it to Eufaula, if the State would recognize the $15,000 per mile granted according to the terms of the original act making the grant.

It will be remembered that the late Legislature of Georgia repudiated these bonds on account of the alleged illegality of their issue, and the road has been seized and is to be sold.

Cairo & Vincennes.

The stations and distances on this newly completed road are as follows:

Ohio & Mississippi Junct'n.	0	El Dorado	81
Vincennes, Ind.	1	Harrisburg	89
St. Francisville, Ill.	9½	Carrier Mills	96
Allendale	15	Stonefort	102
Mt. Carmel	24½	Burnside	106½
Keensburg	31	Tunnel Hill	113
Logan	33	Vienna	122½
Grayville	41	Formen	129
Crossville	49	Belknap	130
Carmi	56	Grand Chain	137
Brownsville	60½	Caledonia	143
Norris City	68	Mound City	151
Gossett	74	Cairo	157

At Carmi the road crosses the main line, and at El Dorado the Shawneetown Division of the St. Louis & Southeastern, and at Norris City the Springfield & Illinois Southeastern road.

Boston, Hartford & Erie.

This company's passenger house in Boston is 355 feet long, covered, sides and roof, with corrugated iron. The company is also building a freight house 300 feet long, which will also be covered with corrugated iron. The iron work is being done by the New England Iron Company, of Boston, and not by the Springfield Company, as was reported heretofore.